NOV 26 1920

NOVEMBER 15, 1920.

WHOLE SERIES, VOL. XLIV. No. 11. THIRD SERIES, VOL. XXXVI.

The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of

Practical Therapeutics

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EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year,	Two Dollars.
Canada, one year,	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year,	Ten Shillings.

E. G. SWIFT, Publisher, - - - DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

LONDON, ENGLAND— 50 & 54 Beak St., Regent St., W. SYDNEY, N. S. W., AUSTRALIA—125 York St.

WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—45 St. Alexander St.

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Whole Series, Vol. XLIV. DETROIT, MICH., NOVEMBER 15, 1920. Third Series, Vol. XXXVI, No. 11.

ORIGINAL COMMUNICATIONS.

ACUTE MASTOIDITIS—INDICATIONS FOR OPERATION.[1]

BY GEORGE MORRISON COATES, A.B., M.D., F.A.C.S.,

Professor of Otology, University of Pennsylvania Graduate School of Medicine; Surgeon to the Ear, Nose, and Throat Department, Pennsylvania Hospital; Consulting Otolaryngologist to the Sharon Hospital and to the Philadelphia Orphanage.

I have selected this title because acute mastoiditis is seen not only by the otologist, but by those practicing most of the other branches of our profession; more frequently in fact in its early stages by the general practitioner, the internist, and the pediatrist. The incidence of acute mastoiditis in children following the exanthemata is too well known to need comment upon at this time, but the experience with troops in the United States Army in the camps and cantonments during the winter of 1917-18 was such as is not so frequently seen in civil practice. Epidemics of exanthemata, particularly measles, among the troops were accompanied by a large number of cases of pneumonia, empyema, and acute suppuration of the middle ear which, in spite of all care, frequently progressed to acute mastoiditis, with its complications, in turn, of thrombosis of the lateral sinus or extradural abscess. Why there was such a large number of mastoid operations in one camp and so few in an adjoining one is susceptible of explanation after study of the local conditions. Of course, the individual practice of the chief of the Section of Surgery of the Head had some bearing upon the total number of cases reported. In some base hospitals he was radical, operating on the seventh day of an unchecked aural discharge, with or without mastoid symptoms, while in others great conservatism was manifest because of surrounding conditions. The condition of the given body of troops, their susceptibility to the exanthemata, their general physique and resistance, whether or not they were hookworm hosts, and the efficiency of early treatment, usually determined the number of operations. It was my pleasure and opportunity to serve at two base hospitals within a hundred miles of each other during that winter. In one there was a large number of mastoid operations done, the patients being hookworm carriers, of poor physique, below par mentally, and subject to every kind of disease; while in the other camp was a division of physically perfect men, as far as that is possible, who had no contagious disease and who had few otitis medias or mastoids. These facts largely determined the issue, but the question of diagnosis was always an open one between camp and camp, and between surgeon and surgeon; and it is often a difficult diagnosis to make. My purpose in this paper is to attempt to discuss each of the usual points of diagnosis and comment on their diagnostic value.

In a typical, classical, uncomplicated case we expect to find:

1. More often a child than an adult.
2. A history of predisposing cause (cold, measles, scarlet fever, bathing).

[1]Read at the annual meeting of the Sharon Hospital Staff, Sharon, Conn., July 30, 1920.

3. A history of pain, earache, and aural discharge of greater or less duration.

4. Redness, edema or fluctuation over the mastoid process, obliterating the temporoauricular crease.

5. An auricle protruding, wing-like, from the head.

6. Tenderness over the entire mastoid process, or over certain points—*e.g.*, the antrum, the mastoid emissary vein, or the tip.

7. Sagging of the posterosuperior wall of the external auditory canal.

8. The membrana tympani red, bulging, or perforated.

9. Discharge of pus through the perforation, or if unperforated, pus in the middle-ear cavity.

10. Impaired hearing of greater or less degree.

11. Tuning-fork tests suggestive of conductive deafness.

12. Fever of moderate degree, 100° to 102°, without marked fluctuation.

13. Pulse commensurate with the fever.

14. Negative eye grounds.

15. Organisms isolated from aural discharge, usually streptococcus viridans or hemolyticus, or pneumococcus.

16. White blood count increased to 12,000 or 15,000.

17. X-ray showing a cloudy mastoid indicating fluid or destruction of cell walls.

18. Any evidence of intracranial complication.

Each of these points must be considered in diagnosing a case as ready for operation. Where all or most of these are present, the diagnosis is easy, yet there are many cases that should be operated upon that present but a few, and due consideration must be given to the value of these and how far they can be relied upon. I hold with the conservative school that believes that a patient, being watched with the utmost caution, should be given the benefit of certain doubts that may be present. An infected mastoid that is opened in the very early stages of the disease does not heal as kindly as one where barriers to infection have been formed in the blood and lymph channels, so that delay is not always a disadvantage, and many a threatening mastoid will clear up and get permanently well after free incision of the membrana tympani and expectant treatment, and that without damage to the hearing function. On the other hand, intracranial complications, when they do occur, are frequently the result of neglect to operate at the proper moment, and even if the mastoid disease itself subsides the patient is at times left with a loss of function due to middle-ear damage caused by prolonged suppuration which finally ceases, by chronic middle-ear suppuration with loss of hearing and danger later, often years later, of intracranial complications, or of chronic mastoiditis with cholesteatoma, which will in the end need a radical operation for safety or cure.

There are two objects to be attained in operating upon an acute infection of the mastoid process. One is to save life, and the other to conserve hearing by bringing to a quick conclusion the middle-ear suppuration by postauricular, or transmastoid, drainage. So that with an acutely discharging middle ear, a mastoid operation may properly be performed, at times, for that purpose alone, and in case of great doubt it is better to operate than to remain idle, for the middle ear will be cured and hearing conserved, even if it is found at the time of operation that the mastoid itself contained little pus.

Let us consider, then, the value of the different diagnostic points I have enumerated and attempt to pick out the essential ones.

1. As I stated before, during certain epidemics, adults may be more frequently infected than children. This is proved by the army experience and by this winter's crop in Philadelphia, where I think I have seen at least as many adults as children affected. Nevertheless, in ordinary times it is more often a child that has this complication develop, and it is usually an easier diagnosis when such is the case, since the outer cranial table in a child is thinner and softer, allowing the infective process more easily to break through.

2. History of predisposing cause. This is not always obtainable and may not be present. Mastoiditis is but a part or a complication of the middle-ear infection and therefore is due to the same cause. When such a history is obtained it completes the record, but is of no very great help toward making a diagnosis. It is of some value as an indication for operation, however, as mastoiditis, following the exanthemata, is much more apt to result in speedy destruction of bone than that following a common coryza, or from bathing in infected water, and this is particularly true in children. I have seen mastoid processes totally destroyed with fistulæ through the external table, in scarlet fever cases in young children, within forty-eight hours after the first earache. With this history present it is inadvisable to wait for resolution to occur, and the chances of permanent middle-ear injury without operation are great.

3. Pain, earache, and discharge. Not seldom an ear starts discharging through a ruptured drum membrane with little or no premonitory pain. As a rule, however, there is sharp earache, which may come to speedy relief in a few hours by the bursting of the drumhead, or may run for days and nights until relieved by the surgeon's incision. But free incision of the drum does not always relieve the earache. The incision may close permanently, or it may not be large enough to relieve the pressure, and in either case pains in the ear will continue or return after once disappearing. In addition the mucosa of the middle ear may be so swollen as to prohibit free drainage from the attic and mastoid. Prolonged mastoid pain, earache, or headache, must be considered as a serious indication for operation when they persist more than twenty-four hours after opening of the middle ear, either surgically or spontaneously. Unfortunately in this case the patient's word must be accepted as to its severity and duration, and this in children cannot be relied upon. The question of discharge is another matter, as it can be directly observed and estimated. When the discharge ceases with closure of the perforation and return of pain so that subsequent perforations are made necessary, we have a sign pointing very evidently toward operation. On the other hand, a continued copious discharge from a wide-open perforation, showing no tendency to lessen or even a tendency to increase, must, in conjunction with other symptoms, or even without them, after due course of time be a positive operative indication. Very profuse discharge usually indicates mastoid infection, and in any case, if this persists for two or three weeks, the middle ear must be drained through the mastoid before the hearing becomes permanently damaged and future complications established.

Absence of pain, earache or suppuration is not of itself a contraindication to operation, though such cases must be studied carefully before deciding against it, if other signs are present. The so-called "primary mastoiditis," when the infecting agent in its passage up the Eustachian tube and through the middle ear has left no trace of its presence, does exist and must be taken into consideration. There may be a history of transitory pain with possibly a slight discharge that had ceased days before, or there may be no such history whatsoever, and yet the mastoid may be infected beyond hope of a non-surgical recovery. These cases usually occur in adults, and I have seen three such the past winter in which the operative findings fully bore out the diagnosis.

The pain complained of is often intermittent in type and worse at night. The intermittency depends upon the freedom of drainage, and the night pain is that classically ascribed to all bone infections. Tenderness is marked, most commonly over the antrum close behind the auricle, next on the anterior aspect of the mastoid tip, and thirdly at the other apex of the triangle, over the mastoid emissary vein. In addition there may be great tenderness of equal degree over the entire mastoid process and even well up over the parietal bone or back to the occipital. It may also extend forward along the posterior extension of the zy-

goma, since there are often affected cells in this region. Tenderness is a valuable sign and also, taken by itself, a most misleading one. It must be borne in mind that many mastoids are normally extremely sensitive to deep pressure, particularly over the antrum and anterior aspect of the tip, and comparison should always be made with the opposite side, granting that this is normal. If both sides are suspected this comparison, naturally, is of little value. In eliciting tip tenderness it is best to bend the head forward and to the side, relaxing the sternocleidomastoid muscles, and with the forefinger inserted well anteriorly and inside the tip, make firm pressure backward. Real tenderness here suggests infection of the large tip cells often found and indicates operation, since naturally they are the ones where spontaneous drainage is least likely to occur. But tenderness alone does not indicate operation, since it is often caused by a cellulitis or furuncle of the external canal. Such tenderness may exactly simulate that caused by mastoid infection. A valuable point in this case is that usually there is marked tenderness also in front of the tragus, which does not occur in uncomplicated mastoiditis unless the zygomatic cells are well developed and greatly involved. Pulling the auricle upward and forward in these cases is exquisitely painful, whereas in true mastoiditis it is painless, but we may, and not infrequently do, have both conditions present. In this case neither the pain, tenderness or even discharge can be relied upon, and the differential diagnosis must often rest on other signs and particularly upon inspection of the external canal and the drumhead, if it can be seen.

Mastoiditis may be present in marked degree with great destruction of the interior of the mastoid process, with little or no tenderness. A very thick cortex combined with a large aditus and free drainage from the middle ear frequently makes the sign of little value, especially if the normal side should be sensitive, for the two mastoids may not be alike in this respect.

4. Redness, edema, and fluctuation over mastoid process.

5. Auricle protruding wing-like from side of head obliterating temporoauricular crease.

These two headings must be considered together, since they are both due to the same cause. What has just been said about the differential diagnosis between mastoiditis and furuncle applies almost equally here.

Redness is often present at an early stage of acute mastoid infection in children, less frequently in adults. Edema is a later stage of the disease and calls for close watching, though not necessarily immediate operation. If furunculosis is ruled out it is an almost sure sign of mastoid disease of progressive character. Fluctuation means that a perforation of the cortex, either gross or microscopical in character, has occurred, except in cases of furunculosis, where there may be a postauricular abscess or a softened postauricular gland without mastoid infection. The protrusion of the auricle must be contrasted with the normal side, and even then it must be remembered that the patient may have one natural protruding or lop ear. It occurs with equal frequency in mastoiditis and furunculosis, if not more commonly in a well-marked case of the latter disease.

In true mastoiditis it depends largely upon the thickness of the cortex whether the infection penetrates the bone in this direction enough to give tenderness or edema, and fluctuation usually does not occur until a fistula has been formed, thus draining the mastoid cells beneath the periosteum. When this occurs the pain and often the tenderness will be noticeably diminished, if not entirely allayed. Redness in itself is no indication for operation. If other causes can be excluded, edema calls for close watching or operation if other indications are present. Fluctuation from any cause indicates at least incision, and probably mastoid exploration.

6. Discussed under above headings.

7. Sagging of posterosuperior canal wall. In the text-books this is spoken of as the

most constant operative sign, and it is undoubtedly of the greatest value. It is caused by the same factors that cause edema over the cortex and is really a localized periostitis from infection of the anterior and superior mastoid cells. As a rule it is easily distinguishable from a furuncle, as the swelling is harder in consistency and is placed much farther back, frequently just outside the drum. If there are no infected cells lying adjacent to this area, however, this sign may not occur, as in infection limited to the tip cells. It also may not occur until late in the disease. If a case has been running a mild subacute course with operation being deferred, and this sagging occurs, the chances against spontaneous resolution are very great and operation will probably have to be resorted to. A previous attack of mastoiditis, even years before, may have left some swelling in this location. There may be some congenital abnormality of the canal wall here which comparison with the opposite wall will disclose, or there may be a beginning exostosis or osteoma. As a rule it is a very reliable guide, since these latter possibilities are rare, but they must be taken into consideration.

8 and 9. The membrana tympani. As stated above, this may be entirely normal in character, and when such is the case a diagnosis is difficult. Fortunately this rarely occurs, most drums showing some signs of recent inflammation if not the actual presence of pus. A bulging drum indicates middle-ear infection, but not necessarily mastoiditis, and likewise a perforation, discharging pus. The character of the pus has little bearing on the question. In the beginning it is usually thin, serous, frequently sanguineous; later it becomes thick, creamy, white, yellow or brown, according to the infecting organism, contamination with other organisms, with dust, or from insufficient cleansing. The odor in an acute case is slight; it is only in chronic cases that the fetid odor is noticed, due to cholesteatoma. Microscopical examination, after staining, will at times reveal minute particles of carious bone, which when present show destruction of the cell walls and mean that conservative treatment is hopeless.

The perforation, if it has occurred, is usually in the posterior half. It may be small or large, is usually circular, and may have a tendency to premature closure with increase in the symptoms when this happens. As a rule a drum that shows this tendency and has to be incised repeatedly indicates severe and progressive mastoid infection, and many surgeons rule that the mastoid must be drained after the second or third unsuccessful myringotomy. A perforation that does not close entirely but remains as a protruding teat or nipple-like process has the same meaning, and search usually discloses necrotic mastoid cells. The same can be said of a continued bulging of the entire drum with or without free drainage, and a perforation that extends rapidly means lowered resistance or a virulent type of infecting organism, and if combined with a free, continued, or increasing flow of pus must be considered an indication for postauricular drainage if not of mastoid necrosis.

In some cases the infection is so virulent that there is a practical coincidence in time between the middle-ear and mastoid symptoms. If seen at an early stage these cases may simply present a bulging and sometimes an inflamed drumhead.

10 and 11. Impaired hearing. In every case of acute middle-ear infection there is impairment of hearing, and as in a severe case of furunculosis the same thing happens from occlusion of the external canal this sign itself is of little value. In addition there may have been an old catarrhal process in the ear under consideration with long-standing deafness of so mild a degree as not to have been noticed by the patient. Where a reliable history of previous perfect hearing can be obtained, a very profound loss of hearing is usually due to infection of the mastoid in addition to the middle ear, since in the latter alone the loss of sound perception is not great. A severe toxic process may affect the labyrinth (vertigo), but the usual deafness is of the

purely conductive type—*i.e.*, that seen in middle-ear inflammation either catarrhal or suppurative. The low-tone limit is raised to 100 or 200 double vibrations per second as shown by the tuning-forks, while the Galton whistle shows the high limit unchanged. Bone conduction is relatively prolonged over air conduction, giving a negative Rinné test, and the Weber test shows the sound conducted to the diseased ear. These tests are only those found in every case of middle-ear inflammation and are in no sense diagnostic.

12. Fever. No dependence can be placed on an increase of temperature or its absence. As a rule fever is present, particularly at the beginning of the disease, but it is only of that degree often found in acute middle-ear suppuration. It may be absent in slowly progressive types where the bodily resistance, local or general, is highly developed. If the fever should be high with the increasing of other mastoid symptoms, or if it should subside and then return without middle-ear or other causes for such a return, or if it should continue after the middle-ear condition has subsided, or last longer than a few days with free middle-ear discharge, it is a very valuable sign. In such cases, when the mastoid is opened, considerable pus is usually found, and the fever terminates abruptly a few hours afterward. Very high fever, 104°-105°, if it persists for more than a few hours and is combined with tenderness, calls for immediate operation, other causes being eliminated; as does long-continued low fever. Intermittent high temperature with relapses to normal, with or without chill, suggests serious complications (sinus thrombosis, extradural abscess, etc.), and calls for investigation at once.

13. The pulse shows us little as it is commensurate with the fever, and aside from its being an index to general condition is of little use as a diagnostic sign. In intracranial complications we at times find a slowing of the pulse as well as respiration and a dulled mentality, but they cannot be considered here.

14. Except in case of intracranial complication, an eye examination is of entirely negative value. There are no eye-ground changes due to uncomplicated mastoiditis. An ophthalmoscopic examination should be made, however, in order to be forewarned of such beginning complications.

15. Bacteriological examination of the aural discharge, when present, is of some help in indicating operation. Certain operators believe that the hemolytic streptococcus in the presence of mastoid symptoms indicates a dangerous condition in which the safety of the patient must be safeguarded by immediate surgical interference. Other organisms have been assigned the same rôle and doubtless deserve it under certain conditions. It has seemed to me that, as the virulence of any type of organism varies from time to time and in the presence of epidemics, too much reliance cannot be placed upon the result of this examination. In our epidemic in Camp Sevier scarcely anything was found but the pneumococcus, and many cases came to operation; while at Camp Hancock, where the streptococcus hemolyticus was prevalent, we had but few mastoids. In scarlet-fever cases a streptococcus infection causes quick destruction of bone and must be combated surgically. Occasionally acute mastoiditis is caused by a staphylococcus alone. Organisms found in the blood stream do not indicate a mastoiditis, though it may be present, but an infection of the lateral sinus or some other portal of entry.

16. The white blood count. We may find the number of white cells increased in otitis media and not increased in mastoiditis. We do *not* find an increase in infection of the external auditory canal alone. As a rule a moderate leucocytosis, and especially a tendency toward increasing, means operation. A case that has been dragging along for a few days with indefinite findings that suddenly begins to show a leucocytosis is probably developing a mastoiditis, but in some cases that show a count of 9000 to 10,000 only, great destruction of the mastoid may have occurred. Such are usually the slowly developing

ones, well walled off and showing little rise in temperature or other symptoms of absorption. The percentage of polymorphonuclears has exactly the same significance as in any other suppurative process.

17. The *x*-ray. Great dependence cannot be placed upon this method of examination, as there are many things that vitiate the findings. *X*-ray plates of the mastoid should be stereoscopic, and a plate should be made of the normal side, if there be one, for comparison. It is not hard to take good mastoid plates—the difficulty is in their interpretation. If the radiologist is an otologist also then it is made much easier, but the average radiologist cannot interpret his plates with uniform success. Neither can the otologist satisfactorily in every case read some one else's plates since he knows not the angle of exposure. Intelligent coöperation and inspection of plates together is a great help, but every otologist should be able to read good average plates of the mastoid and should be guided largely by his own judgment, for he, with his knowledge of the clinical side of the case, is in better position to give a good interpretative reading than the radiologist. In comparison with the well ear it must never be forgotten that that ear may have been previously diseased, maybe long ago, with sclerosis of the process; maybe but recently, but enough to cloud the cell area. It must be remembered also that the ear under examination may have had the same experience and show cloudy cells even though there is no disease present at the time of examination. A non-cellular mastoid at times gives the same appearance as one where the cell area is broken down and full of fluid.

Generally the *x*-ray picture taken by a competent man and read by intelligent coöperation is a great help, but operation must not depend upon this alone, either for or against. I have operated repeatedly this year in spite of negative *x*-ray reports and found my disease, and I have failed to operate in the presence of positive reports and my patients have gotten well. When the case is in doubt, a positive or negative *x*-ray may well be the deciding factor.

In reviewing briefly our discussion of these seventeen main points of diagnosis, it will be seen that there is not one that is a positive indication for operation or which cannot be attributed to other causes. If such causes can be eliminated, some of them become indications, such as continued and increasing tenderness, mastoid swelling, protruding auricle, increased or continued fever, pain, increased blood count, etc. But it takes a combination of a number of these points to establish an operative diagnosis, and the different combinations are numerous. So that I fear I leave the subject as a whole about where it was before I started. The judgment of the surgeon in each individual case must determine the issue. If such were not the case, where would be the need of long training and experience? The more cases we see the more readily and easily we reach our conclusion, but I have attempted to bring before you for your consideration the fallacies as well as the value of the different examinations we must depend upon.

Before closing there is one other difficulty that should be mentioned—that is, in the presence of a double suppurative otitis media with signs of systemic infection but with indefinite local signs, which mastoid is it that is the involved one? Careful study of each middle ear and mastoid, with painstaking comparison, can alone answer the question. Both mastoids are not infrequently involved simultaneously, and double mastoidectomies are not uncommon. The one showing the most marked indications of disease may in reality be the one least involved, owing to structural differences. If, after mastoidectomy on one side, general symptoms fail to subside, the whole subject must be studied anew to differentiate between mastoiditis of the opposite side and intracranial involvement on either side, and the diagnosis is immeasurably more difficult. In simple cases a diagnosis can be made without difficulty, but in those not so simple it is necessary

to call in every aid at our command. After all, in case of continued doubt, operation is the safest procedure and as such is fully justified, since the operation itself is not dangerous to life, preserves and conserves hearing, and usually speedily terminates the aural suppuration. By employing modern methods of operation and after care the convalescence is short, often but a week or ten days to complete healing, with but two or three days' confinement to bed, and the cosmetic result such that in a few weeks the scar can scarcely be seen. This result is especially true of those cases in which operation has been delayed for some time. As a rule they heal better than those operated upon in the early stages, but operation should not be delayed for this reason alone. The well-known fact that many cases become permanently well by conservative treatment is a more valid reason, but it must not be stretched too far.

POINTS IN REGARD TO THE TREATMENT OF RENAL DISEASE—A CLINIC AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY H. A. HARE, M.D.,
Professor of Therapeutics and Diagnosis.

I wish to discuss with you to-day some points in regard to the very important subject of diseases of the kidneys, not touching upon suppurative processes in these organs, but dealing particularly with the conditions to which the term "chronic nephritis" has now been applied for many years. This in reality is a most unfortunate term because the idea that an inflammatory condition more or less acute and finally chronic is a characteristic pathological change. Equally unfortunate is the term myocarditis, which is used to indicate that there is present a degeneration of the heart muscle. The terms nephritis and myocarditis should be reserved in my opinion for an acute inflammation in the kidneys or in the heart muscle as the result of acute infection.

It has also been customary for many years to divide cases of so-called chronic nephritis into two groups: Chronic parenchymatous nephritis, a term which indicates that the lesions involve the parenchyma or secreting portion of the kidney, and chronic interstitial nephritis, a term which indicates that the lesions develop in the connective tissues of these organs. As a matter of fact you can readily appreciate that this is not only a very artificial but an erroneous form of classification, for it is quite impossible to imagine a degenerative change taking place in the parenchyma without some change in the connective tissue, and equally impossible to conceive of marked changes in the latter without the secreting part of the organ being involved, yet by the use of these terms students are misled into the belief that two widely separated pathological conditions exist. Fortunately, the clinical manifestations and course of so-called chronic parenchymatous nephritis and chronic interstitial nephritis differ so widely that there is more justification for this classification from a clinical standpoint than there is from the standpoint of pathology, for parenchymatous nephritis of the chronic type runs a course of months, whereas chronic interstitial nephritis sometimes exists for one or two decades before the patient's life is destroyed.

Another factor which you must consider when brought face to face with either of these types of kidney disease is that when the patient presents himself for diagnosis and treatment he is usually already well along in the developed stage of these lesions. In other words, it is not until some predominant and imperative symptom characteristic of these two conditions develops that it occurs to him that it would be wise to get medical attention, and by this time the changes have advanced so far that nothing can be done to correct them, although

something may be done to arrest their progress and much can be done, at least from the standpoint of diet, which will be a direct benefit to the kidney lesions and which will aid the patient in prolonging his life.

On the other hand there can be no doubt that many medical men, recognizing the futility of medicinal agents in these cases except for the relief of collateral symptoms, have been far too rigid in the institution of the so-called diet. You will find it a very frequent practice on the part of many physicians as soon as albumin and casts are found in the urine, to place the patient upon a rigid milk diet, or in other instances to deprive him of all albuminous food, placing him almost entirely upon a carbohydrate and fat diet. In the majority of instances, if not in all, this is bad practice based upon ancient custom rather than upon modern knowledge. A strict milk diet fails to nourish the patient, for if his requirements are from 2500 to 3000 calories per day, he cannot get this number of calories unless he drinks between five and six quarts of good milk in each twenty-four hours, which is manifestly impossible, and if it is attempted burdens the stomach, upsets the digestion, and calls upon the kidneys to eliminate an enormous quantity of liquid when they are already in trouble. Furthermore, a strict milk diet, like a strict carbohydrate or fat diet, fails to recognize nutritional balance, or, in other words, that for the maintenance of health a patient should receive a certain proportion of protein, carbohydrate, and fat if not daily at least every few days. The result of the institution of a strict milk diet is extreme distaste for milk and a form of starvation, because the patient not receiving enough nourishment in the milk uses his own tissues and thereby loses flesh. In some instances he undoubtedly develops that as yet unexplained but nevertheless real state to which the unfortunate term acidosis is given, because he is starved, and as he is feeding on himself he loses nervous and muscle vigor, becomes disheartened, and rapidly succumbs to any infection which may attack him in his impoverished state. Indeed, I am inclined to think that when a patient with chronic nephritis is ordered a strict milk diet for a long period of time he might well exclaim, "Save me from my friends!"

It is becoming increasingly evident from studies upon kidney functions made by physiologists and clinicians during the last two decades that in different cases different functions of the kidneys are impaired. In some cases the ability to eliminate fluid is chiefly affected. In one case this is associated with actual impairment of the power of passing out fluid. In another case, in which dropsy is usually present, the fault does not lie with an inability on the part of the kidneys to eliminate faster, but rests upon the fact that the kidneys cannot eliminate chlorides, and these salts being retained in the body the system finds it necessary to retain fluid in its tissues to dilute these salts in order that the fluids of the body may have a normal tonicity of approximately 0.9, since such a tonicity is essential to existence.

It is in this type of case that the salt-free diet so-called is applicable and practically only in this type of case, so that before subjecting your patient to the annoyance and discomfort of instituting a salt-free diet, the chlorides in the urine should be estimated. On the following day he should receive about 75 grains or more of common salt and his chloride elimination be again estimated. Kidneys capable of eliminating chlorides should be able to get rid of this excess of salt added to the diet within twenty-four hours. If they do not and dropsy is present, the so-called salt-free diet is rational. If the chlorides are not retained, it is irrational.

So, too, it may be said that certain cases of renal disease lack the ability to get rid of other solids than the chlorides, as, for example, nitrogenous educts.

It has long since been discovered that urea is not poisonous, although the word uremia was probably introduced into medicine with the thought that the symptoms of uremia were due to the retention of

urea. We now know that urea exercises a valuable diuretic effect; indeed it is so powerful that it has been used deliberately for this purpose, many physicians giving as much as 20 to 60 grains a day by the mouth in order to stimulate the kidneys to increased activity. It is interesting to note that the best results from the administration of urea seem to accrue in cases of dropsy of marked degree, although it is also important to remember that it must be continued for some weeks to get its full value.

There are two methods by which we can determine if it is necessary to materially diminish protein intake in any case of nephritis. One of these has been given the name of the Mosenthal method. This consists in having the patient take a moderate evening meal, drinking with it his ordinary amount of fluid, but forbidding the ingestion of any other food or drink before going to bed. The urine is collected three hours after the meal and until immediately after breakfast. It has been found that in a normal individual the amount varies between 400 and 750 Cc., and any excess over this may be considered as indicative of an extra effort on the part of the kidney to get rid of solids which ought to be eliminated, provided, of course, that pyelitis, diabetes, and diseases of the bladder which produce reflex irritation are not present. In other words, according to this proposition nocturnal polyuria so frequently met with in cases of interstitial nephritis is not alone due to the high blood-pressure so common in this disease, but to an endeavor on the part of the kidneys to get rid of waste material. This increased effort on the part of the kidneys is not only significant of impairment of function in eliminating solids, but is to be regarded as a factor in producing fatigue of the still competent secreting portions of these organs.

A more difficult method for the general practitioner than that of Mosenthal, but one which is, of course, far more accurate, is the estimation of the non-protein nitrogen of the blood, which should not be in excess of between 25 and 30 mgr. per cent in normal individuals. If it rises as high as 65 mgr. per cent, it indicates serious retention and definitely places the patient in the class which requires the cutting down of protein foodstuffs in order that there may not be such a supply of waste products as is present when a full protein diet is employed. If the proteins are cut down in such cases the carbohydrates should be increased, not only because they afford another method of sustenance, but also because a patient who is on a high carbohydrate diet metabolizes less protein daily than if he is starved, which, as you see, has some bearing upon the matter of a pure milk diet which I have already discussed.

Even in the cases just described it usually is not essential to use an absolutely protein-free diet for reasons already given. By testing the blood for non-protein nitrogen the physician not only obtains a guide as to dietetics, but as to prognosis, since if after the protein intake has been materially cut down and the carbohydrates increased the retention products remain the same, it is evident that the so-called threshold for the elimination of these substances is materially raised, or in other words, that the kidneys are very dangerously impaired.

Another point to be considered in regard to a non-protein diet is that which deals with the theory of Epstein, that a deprivation of protein not only starves the patient of necessary food ingredients, but also changes the osmotic pressure of the blood in such a way that dropsy develops. On this theory Epstein has gone so far as to recommend a liberal protein diet in nephritic dropsy, and he and his followers have undoubtedly been able to report patients who were dropsical who have been relieved of this symptom by feeding proteins liberally. On the other hand, many clinicians have failed to get such results and do not accept Epstein's theory.

In all probability we may state that the high protein diet may be tried in cases of renal dropsy unless an examination of the blood reveals an abnormally high non-pro-

tein nitrogen. But it is worthy of note that no less an authority than Sir Clifford Allbutt has spoken enthusiastically in favor of a high protein diet in many cases of albuminuria and edema.

The subject of to-day's clinic is not only important because of the frequency with which you will meet cases of so-called nephritis and because of the fatal outcome of all cases belonging to either group, but also because it serves to emphasize the fact, which I have so often reiterated to you, that there is no cut and dried method of therapy suitable to every case which comes under your care, that each case is a law unto itself, and that rigid dietetic, medicinal or other measures cannot be resorted to in all cases that show albumin and casts, in large or small amount, without disaster to the patient.

PROPHYLAXIS OF HEART DISEASE IN CHILDREN.

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To every one, fascinated by the very terribleness and pathos of the picture, who has stood, powerless to help, by the bedside of a child suffering from the effects of broken compensation due to heart disease, the thought as to how to prevent such extreme agony must surely have come. Cardiac disease at this stage of its progress renders its young victim mortally and hopelessly ill. Before its inception cardiac disease is preventable. In its incipiency it is sometimes curable. Likewise a careful study of the established case prevents, or at least renders remote, the incidence of decompensation. Hence careful consideration of the etiology of cardiac disease and the means of prevention becomes the mandatory duty not only of the pediatric internist but of the family physician, and of the equally important parent. Momentary contemplation of the frequency of what a distinguished English author describes as "this terrible disease" and again as "the most distressing disease of childhood" provides ready verification for the truth of this statement. According to Still[1] 10 per cent of all children at the Great Ormond Street Hospital, London, suffer from some form of endocarditis. William L. Post,[2] in an article appearing in the *Archives of Pediatrics* for December, 1917, records 219 cases, or a little less than 10 per cent, of acquired cardiac disease in 2259 children examined. This same author quotes A. L. Goodman's statistics as the proportion of cardiac diseases to be 24 per cent of all cases admitted to the A. Jacobi Division of the German Hospital of New York City. The effect of these figures upon both child and adult mortality and morbidity is appalling, and, aside from urgent sentimental and humanitarian considerations, demands the closest scrutiny of all etiological factors, however apparently remote they may seem to be, and, consequently, of all possible preventive measures.

While recognizing that endocarditis rarely occurs independently of at least some degree of involvement of the myocardium as well, and often of the pericardium too, the term acute endocarditis is here used advisedly as interchangeably synonymous with cardiac disease or heart disease, or whatever word or combination of words may at the moment be employed to represent organic heart disease in the young. The writer wishes to emphasize the fact that inflammation of the endocardium not only represents the most frequent form of chronically diseased hearts, but that acute endocarditis also represents the inception, the very fountain-head, as it were, of nearly all forms of heart disease, and that prophylaxis applied to this stage of the disease may stay its further progress and even, as before stated, result in the entire effacement of the process, at least clinically. Still[3] found 93

cases of endocarditis in 128 cases of cardiac disease. Poynton[4] in 150 autopsies performed upon cases dead of heart disease, found the mitral valve inflamed in 149.

Recognizing endocarditis to be practically always an infectious process, it is well-nigh impossible, by the very nature of things, for the medical mind to conceive that this condition could arise as a purely primary process. It probably never does. There are incidences in which the inception of cardiac disease is so insidious and in which it masquerades, for the time at least, as other less serious entities, that for practical purposes, only in so far, however, as diagnosis is concerned, may the condition be regarded as a primary disease. This statement is made only to emphasize the importance of diligent and continuous search for the tell-tale murmur which will eventually appear and also for the portal of entry of infection. These cases are represented by apparently only slightly ill children. There is a subfebrile temperature marked by unexplained exacerbations. These are usually attributed to gastrointestinal disturbances. Slight anemia, breathlessness, general malaise and indisposition, lassitude and coated tongue, anorexia and tachycardia are added and suspicious features, to the experienced clinician. Not infrequently marked loss of weight ensues. Such cases may exist for weeks before being recognized. A blood examination in the interim will reveal a mild leucocytosis. Blood cultures usually reveal nothing. Reference will again be made to these cases.

Etiologically, however, for the purpose of safety, it is best to regard endocarditis purely as a secondary disease. Infection, even in those cases which eventually become hopeless, may enter so insidiously and without leaving a trace behind that it is permissible to repeat that a minute and painstaking study of the portal of entry should be made.

Rheumatism and heart disease are so commonly associated that one cannot speak of the one without referring to the other. In fact endocarditis may, for the time being at least, be the only manifestation of rheumatism or at least the only prominent manifestation of it, the others being so slight as to escape attention or to be ignored. This has particular reference to the so-called "growing pains" of adolescence, which are invariably rheumatic and which are commonly disregarded until their significance is recognized too late by both physician and layman. They should always excite serious attention and call for radical investigation and treatment. Granting therefore the possibility of endocarditis as being the *sole* manifestation of rheumatism, we have an explanation of the so-called primary cases of endocarditis to which reference has just been made, and the lay expression of "rheumatism of the heart" becomes a reality. The close interrelationship between endocarditis and rheumatism is further emphasized by Still,[5] who reports 128 murmurs as occurring in 170 cases of rheumatism; likewise, though conversely, of 150 cases of heart disease he refers to 142 which showed evidences of rheumatism. In Holt's[6] 117 cases of heart disease, 93, or 80 per cent, gave a history of rheumatism. It is evident therefore that a correct study of the etiology of heart disease must embrace the thorough study of the etiology of rheumatism in all its manifestations. Rheumatism, and therefore endocarditis, must in the light of all investigations undoubtedly be regarded as infectious. Predisposing causes which provide a proper environment for the development of the microörganisms must in no wise be minimized. Consequently, dampness, poor hygiene, poor housing conditions, poverty, ignorance, hypertrophied tonsils, and all means which influence the formation of foci of infection, become factors of prime importance to all except those who are so blinded by their pursuit of the particular type of infecting microörganism that they cannot see anything else. This reference to predisposing factors will, however, be regarded as sufficient here to indicate the proper direction of thought for those who are interested in a study of the etiology and prevention.

Time will not permit a more detailed discussion. The means of prevention logically follow the recognition of causes and become self-evident.

A résumé of the bacteriology of this disease which did not emphasize the importance of the brilliant studies of Poynton and Paine[7] would be incomplete. The investigations of these authors undoubtedly indicate the etiologic significance of the "diplococcus rheumaticus" as the exciting agent of both rheumatism and of endocarditis and of tonsillitis. On the other hand, the more recent studies of Rosenow[8] seem to point definitely toward a certain type of streptococcus as the bacteriologic entity responsible for the disease. His studies further emphasize the important and close inter-relationship between tonsillitis and rheumatism and heart disease and chorea, the same organism being recovered from the tonsils as was found in rheumatic patients. This undoubtedly points strongly to the tonsils as at least one important portal of entry. Rosenow's studies in the transmutation of microörganisms also suggest that the organism which is responsible for rheumatism and tonsillitis may be the same streptococcus responsible for other well-recognized infections, except that it has become changed morphologically and culturally by cultivation. This may explain the occurrence of cardiac complications when appearing in other diseases—scarlet fever, for instance. At least the theory is fascinating and would explain the present uselessness of serum, while holding hope for the future when the various strains and their methods of production may be better understood and recognized.

If in the nosology of endocarditis we acknowledge the important rôle of rheumatism it is important that the protean evidences of this disease be clearly recognized. This has reference particularly to the more or less obscure manifestations of it. In this connection reference should be again made to "growing pains" as well as to rheumatic nodules, torticollis, certain forms of obscure but recurrent headache, adenitis, and even to appendicitis. Thus the operation for the latter disease, aside from its immediate life-saving properties, assumes prophylactic importance in reference to cardiac disease in children, in whom we are daily seeing more cases as our diagnostic ability permits us to differentiate more skilfully the various acute gastrointestinal phenomena. Rosenow[9] was able to produce symptoms of meningeal irritation by injections of his rheumatic streptococcus, and recovered certain strains of this organism from nodular areas which, as the result of these injections, formed in the pia. Dick and Rothstein[10] have shown chorea to be due to a streptococcus. From the foregoing the close inter-relationship between rheumatism, endocarditis, tonsillitis, and chorea seems established. It should be axiomatic therefore to regard every case of rheumatism, however obscure, tonsillitis, or of chorea, however mild, as potentially a case of endocarditis. In fact, it may with perfect consistency, and added safety, be regarded as part of the disease itself—the first stage, as it were, during which period there is sufficient time still remaining, if proper means are employed, to entirely forestall, or at least modify or prevent, a recurrence of the cardiac stage. Thus it would appear that the safest rule would be in all cases of either rheumatism, tonsillitis, chorea, etc., to advise tonsillectomy as a routine prophylactic measure. My rule has been, whenever my advice has been followed, never to permit the second attack of follicular tonsillitis to take place. I regard the first attack to be sufficient cause for complete extirpation of these bodies. I have advised and have had practiced tonsillectomy during an attack of acute articular rheumatism, and during an attack of chorea. In no instance, while no harm was done, have I been able to prevent the subsequent occurrence of a murmur. My cases are too few, however, to warrant any conclusion on this point, and it would be of interest for the pediatrist and the laryngologist to coöperate in a series of cases of well-defined acute rheumatism and of chorea, to study, subsequent to oper-

ation, the number of cases which developed murmurs and those which did not. It may be that in my cases the operation was undertaken too late—*i.e.*, the endocarditis had already developed—although the murmur was not in evidence at the time of operation. In one case it developed the next day. However, I believe that every case of rheumatism with a murmur and every case of acute or subacute or even chronic endocarditis without rheumatism, where decompensation has not occurred, should, in view of the fact that we regard the tonsils as the portal of entry, have these organs removed, especially if they show the least evidences of disease or where the history reveals previous inflammation. In several such cases which I have had operated on no ill effects followed ether as an anesthetic. In no instance likewise have my patients experienced a recurrence of either their rheumatism or, what is more important, their endocarditis.

Other infectious processes, as influenza so called, although not so constantly associated with endocardial inflammation, demand our serious attention. I believe dental caries and a filthy mouth to be of vast importance in this respect. Parents, and I regret to say dentists as well, require education as to the need of oral and especially of dental asepsis and antisepsis. I have had most serious difficulty in securing coöperation from the dental profession in the matter of filling or of pulling decayed deciduous teeth. The dentists simply will not look upon the situation from the medical view-point unless they are forced to it. I have advised many mothers to have the carious teeth of their children cleansed and filled with cheap fillings, and have had them return with the statement that the dentist refused to do the work on the ground that the teeth, being deciduous, would sooner or later fall out anyway. I now have one or two dentists who have consented to submerge themselves and who will do for me work which I am unable to do myself, but which I am capable of directing. Parents likewise require education in the matter of teaching the children the early use of a suitable tooth-brush. Bad teeth may be pulled while the child is under ether for tonsillectomy.

Otitis media I have seen followed by cardiac inflammation. It is therefore important to secure the services of a competent otologist early or for the practitioner to equip himself so that he may be able to perform paracentesis of the tympanum. What is of greatest importance is that he should equip himself to be able to conduct a careful otological examination and to decide definitely as to the presence or absence of otitic inflammation in every case of temperature in an infant or child which he is called upon to treat. While not all inflamed drumheads require incision, many of them do, and it is only by a routine examination that the matter can be decided.

With reference to the etiology and prophylaxis of cardiac disease many extramedical factors assume a rôle of prime importance, even far outshadowing well-recognized medical causes. These may be briefly included under the lack of complete parental and professional coöperation in the management of the so-called minor ailments of infancy and childhood. I have long felt that only by means of education and popular propaganda presented to the laity in understandable terms can the increasing yearly crop of juvenile cardiac morbidity and mortality be successfully reduced. For instance, the importance of an attack of tonsillitis is little understood by the average layman. This should be brought home to him. Methods of prevention of this and other simple infectious ailments should be taught to him. It should be emphasized that apparently innocent maladies leave behind them, not infrequently, a state of semimorbidity, which is more or less ignored by the parents and consequently by the physician, as his advice is not sought. These ailments may be the beginnings of permanent invalidism due to chronic cardiac disease. For one reason or another, frequently economical, many of these minor acute infections of a recurrent nature receive home treatment

throughout, or medical advice is discontinued as soon as the first signs of improvement appear. The greatest damage is done by permitting these sick children to arise from their beds too soon, especially if their temperature has not quite reached normal. Mothers will frequently proclaim their inability to control the activities of their children. Often their attempts are halfhearted, especially if the children appear well. This is particularly disastrous in cases of rheumatism, where the only symptom which remains is an endocardial murmur. The physician knows that the child is still sick. The mother, however, does not, and it is a most difficult matter to convince her and the child that a rest period in bed of from six weeks to three months is necessary to give the child the chance of its life to arise from bed without a crippled heart, for at this stage complete cure is still possible. I have had some bitter experiences in this direction. I have pleaded, begged, cajoled, threatened, offered my services gratis, but without avail. It is a safe rule of practice nevertheless to confine all juvenile febrile cases in bed until the temperature has remained normal, or better subnormal, for at least one week.

Where it is impossible to secure proper parental control of the child's activities, it is advisable to place the child in the charge of a trained stranger. The wealthy may employ a trained nurse; the poor cannot. For these at present the hospital offers the only alternative. The poor are frequently prejudiced against hospitals. This must be broken down by intelligent persuasion and education. It is not always successful. On the other hand, the ordinary children's ward is not the best place to secure complete control of these cardiac diseases, on account of the lack of facilities to provide individual attention. What are really needed are convalescent homes devoted entirely to the care of cardiac diseases, with a sufficient number of trained attendants to control the activities of the patients. These institutions are lacking now. Their establishment should be the object of philanthropic and State consideration.

Thus it can be seen that educational and sociologic factors are largely influential in determining the future state of health or of morbidity and even the future life or death of many individuals. Ignorance, superstition, suspicion, mistrust, poverty, and semipoverty, most commonly afford the greatest resistance to professional effort. Improvement of the social status of the individual will markedly lessen the incidence of cardiac disease in the young simply as a natural consequence and as part of a general social and physical uplift.

REFERENCES.

1. Still, G. F.: "Commoner Diseases of Childhood."
2. Post, M. L.: *Archives of Pediatrics*, December, 1917.
3. Still, Geo. F.: "Commoner Diseases of Childhood."
4. Poynton and Paine: "Researches on Rheumatism."
5. Still, Geo. F.: "Commoner Diseases of Childhood."
6. Holt, E. L.: "Diseases of Children."
7. Poynton and Paine: "Researches on Rheumatism.
8. Dunn: "Pediatrics."
9. Dunn: "Pediatrics."
10. Dunn: "Pediatrics."

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TREATMENT OF LUPUS VULGARIS BY THE LIQUID ACID NITRATE OF MERCURY.

ADAMSON, in the *British Medical Journal* of July 24, 1920, states that his experience in the treatment of lupus with acid nitrate of mercury covers only a period of some nine months, but the results obtained have been so successful that he wonders why this already well-known remedy should have remained neglected.

The cases which have been treated by this method in the skin department of St. Bartholomew's Hospital may be arranged in four classes:

1. Single patches of non-ulcerated lupus of the size of a shilling to that of half a crown, which have received no previous treatment.

2. Old cases of lupus which have been treated by other methods, but in which lupus nodules still remain in the scars.

3. Ulcerated lupus, often of large extent and with much surrounding inflammatory infiltration.

4. The common type of lupus of the nose, involving frequently also the nasal septum, the palate, the upper lip, the cheek, and sometimes the lacrimal sac and skin over and around, a type very difficult to deal with by Finsen light or by scraping.

The liquid acid nitrate of mercury is applied by means of a small swab of wool tightly twisted around the ends of a finely pointed pair of forceps. It is painted on to the affected areas freely and with firm pressure for one to two minutes, taking care to limit the application exactly to the lupus patches, to isolated nodules, or to ulcerated surfaces. In the case of isolated nodules or non-ulcerated lupus patches the effect of the application is after a minute or so to change the semitranslucent reddish-brown "apple jelly" lupus tissue, so that it takes on a dry, yellowish-white opaque appearance. No dressing is applied, and the patient is seen again in a week. The yellowish-white opaque appearance has then given place to a thin brownish crust, which falls in a few days and leaves the affected area sometimes completely healed, sometimes as a shallow ulcer which heals in a few days. In many instances a single application has been sufficient to replace the lupus by a smooth healthy scar without any remaining lupus nodules. In other cases isolated nodules have remained in the scar, and it has been necessary to repeat the application one or more times. The application is only slightly painful at the time, but is followed by more severe pain for several hours.

In the case of ulcerated lupus, after removing all crusts, the solution is freely painted on to the ulcerated surface. This causes considerable pain, but if a not too large area be done at one sitting it is easily borne by most patients. The after-effect upon ulcerated surfaces is rather different from that upon non-ulcerated lupus. The surface of the ulcer becomes dry, yellowish-white, but in a few days much serous exudation gives rise to a thick heaping up of crust. At the end of a week the crusts are picked off, or bathed off, and there is then an ulceration with purulent surface and a margin of pink healthy epidermis, which heals in the course of a week or so. The number of applications required in an ulcerated lupus depends upon the extent of the disease and the depth of the inflammatory infiltration which often accompanies these ulcerations.

In those cases in which the nose is involved the treatment by Finsen light or scraping is rendered difficult owing to the deep involvement of tissues other than the skin. The disease, which usually starts in the mucous membrane of the anterior part of the septum and spreads hence through the whole thickness of the nose to appear as nodules in the skin of the nose, sometimes also perforates or destroys the cartilaginous septum, spreads upward to involve the lacrimal sac, downward to the upper lip, backward to the hard and soft palates, and along the lymphatics, to appear upon the skin of the cheek midway between the nose and the ear. But even in these difficult cases in which much of the disease would seem to be out of the reach of a local caustic application, the liquid acid nitrate of mercury has produced far more rapid improvement than any previously adopted method of treatment. A lacrimal abscess may be swabbed with the solution. The solution may be carefully painted on to lesions in the nose or on mucous membranes, and all nodules or ulcerations on the skin surface similarly dealt with. In extensive cases all this may be done at one "sitting" under a general anesthetic; but it can also be carried out gradually without any anesthetic by applying the acid little by little to different parts at different visits. No complete cure can as yet be claimed in an extensive case of lupus. The period of employment of this remedy has not yet been sufficiently long, but the good results already obtained seem to justify a more general use of the acid nitrate of mercury in the treatment of lupus.

EDITORIAL.

THE LATE EVIL EFFECTS OF ANESTHETICS.

The evil after-effects of anesthetics may develop during their administration in the shape of some acute complication, a number of hours afterwards, as in so-called post-anesthetic acidosis, and perhaps not for many days afterwards in the sense that the use of the anesthetic produces a disturbance in nervous balance and control. Much has been written in regard to the effects of these drugs upon the nervous system along the line of their ability to increase shock psychically and physically, but too little attention has been paid to their ultimate effects.

It not infrequently occurs in the experience of the general practitioner that he refers a patient for a surgical operation, that the operation is survived, that the surgical task is well performed, that perfect healing occurs and the patient is returned to him as an operative recovery; but he learns by observation, or by the patient's statements, or the statement of her friends or relatives, that she is irritable, difficult, and often prone to tears for inadequate cause. In other words, the anesthetic has passed away in its effects so far as its immediate influence is concerned, but has left a stigma upon the nervous system which in many cases lasts for days or even months, and this is not surprising when one remembers that these drugs are given to persons already disturbed psychically and nervously by their illness, that they transfer the patient from consciousness into unconsciousness with great rapidity, and that the return to consciousness, if the drugs have been properly administered, is also very rapid. So far as we know the development of surgical anesthesia with its associated unconsciousness is perhaps more closely akin to what actually takes place at the approach of death than any other experience to which a living being approaches before the actual end comes, and so it is not surprising that late effects occur, which for a time at least may make the patient even more miserable than the condition for which the anesthetic was given.

Interesting investigations within very recent times upon this psychical effect of anesthetics have been made upon animals, and we think it would be interesting if some of the laboratories devoted to the influence of the effects of drugs upon psychical processes would study this matter more thoroughly in human beings. Mora has studied the effects on the psychical processes of albino rats, using what is known as the circular maze invented by Watson. By the use of this maze one can study the rate at which albino rats exercise their mentality and memory. Placed in the maze they rapidly learn to find their way through it by the shortest route and in the quickest time. In additional investigations made by both Mora and Nacht they administered the three commonly employed anesthetics, ether, chloroform, and nitrous oxide with oxygen, to rats after they had become skilled in going through the maze, and studied them with special reference to how soon they regained their normal intelligence after the anesthesia was over. It was found after chloroform the rats were depressed for a very long time in the sense that their memory was impaired and that their agility was diminished. Ether, however, did not produce much depression unless given over a long period, but even when so used the animals recovered more quickly than after chloroform. As would be expected, the use of nitrous oxide and oxygen anesthesia was the least depressing of the three in its late psychical effects.

While we are not inclined to attach too much importance to the experiments upon albino rats as applied to human beings, nevertheless this line of investigation opens up a wide field for interesting study and

confirms the views of those who accurately study their cases after anesthetics have been given.

THE MARRIAGE OF PHARMACOLOGY AND PRACTICAL THERAPEUTICS.

During a course of many years we have frequently pointed out in the pages of the GAZETTE that an unfortunate condition of affairs exists in that the pharmacologist and the practical therapeutist are usually as far apart in their points of view as they can possibly be. The pharmacologist is inclined to regard with little respect the practical conclusions reached by the bedside doctor, and the bedside doctor often finds to his regret that the pharmacologist produces little which helps him in the struggle with disease, and not rarely, as a result of a few laboratory experiments on animals, attempts to prove that the physician is entirely in error in his use of a drug and in his conception of how it acts in the diseased human organism.

This editorial is headed as it is because we are glad to note that there is evidence accumulating to show that these widely separated groups of men are coming together more and more with the recognition that their common object is ultimately the successful treatment of disease. The results obtained in the laboratory may be different from those at the bedside, and under these circumstances it is the duty of the laboratory man not to condemn what is done, but to find the reason for the discrepancy in result. Some years ago it was claimed by some pharmacologists that alcohol was of no value as a drug. As a matter of fact the ultimate conclusion is that it is of value as a drug, although it does not act in the way in which the physicians of forty years ago supposed it to act.

Numerous other illustrations of this kind might be cited, but one more which has served to call our attention to this matter will suffice. For many years the medical profession and a vast majority of the laity have believed that by means of external applications pain might be relieved, although there have been some ultra-scientific persons who have laughed at this proposition and have claimed that when belladonna or opium, or other pain-relieving drugs, are applied to the skin the relief comes from the imagination of the patient and not because the drug produces a direct effect.

Recently, Macht has published a number of interesting papers on what he calls psycho-pharmacology. This term might be used to indicate the effect produced upon the mind by the administration of drugs, but this is not exactly the meaning intended by Macht, who really means the influence of drugs upon the brain as to its intellectual and sensory functions. He points out that the very general use of opium preparations in lotions, plasters, ointments, suppositories, etc., would indicate that physicians believe that such local applications are efficient, and while he recognizes, as we do, that this view has been criticized, he nevertheless has performed experiments which prove that those who have employed such applications have not gotten results due to their imagination, but that the drug has been actually absorbed, or to use his words, it is evident that opium, although preëminently a central nervous agent, does act to some extent upon peripheral structures such as sensory nerve endings, and that the empirical observations of the older clinicians who advocated local applications of opiates for the relief of pain are not without foundation.

THE INTRA-ABDOMINAL INJECTION OF OXYGEN GAS.

Within comparatively recent times a number of practitioners, chiefly those interested in *x*-ray examinations, have suggested and carried out a plan of injecting oxygen gas through a needle directly into the peritoneal cavity in the same way that normal saline solution is now frequently administered in a condition of collapse occurring in infants.

In years gone by such oxygen injections were attempted as a therapeutic measure in

peritoneal tuberculosis, but did not produce the results desired. Such injections, however, proved that oxygen gas could be so introduced without very great danger, and a number of writers have recently appeared in medical literature highly lauding these injections as a method by which, with the aid of the *x*-ray, the outline of various abdominal organs can be clearly made out.

It is true in medicine and surgery as it is in many other walks of life, that there is a vast difference between what can be done and what ought to be done. The number of instances in which it is essential to outline abdominal organs by this means must be few and far between. Older methods of examination, except in very rare instances, give adequate information, and if they fail the question arises as to whether the information which can be gained by this radical measure is of sufficient value to justify it.

It is admitted by those who advocate the injection of oxygen intra-abdominally that the patient may suffer from dyspnea, that he should remain at absolute rest for a number of hours, and that his body should be placed in such a posture that respiration and the action of the heart are not interfered with; in other words, it is admitted that the injection of oxygen is not a perfectly harmless procedure.

When given to a patient with grave abdominal disease it may break up adhesions, or by its pressure seriously interfere with the already impaired function of certain organs. Thus in a case of mitral stenosis recently seen by the writer, in which there was great enlargement of the liver, an enthusiastic advocate of this method injected oxygen in order to make the outline of the liver more clear. From the time of that injection the patient rapidly became worse and insisted that the injection was responsible for the increase in the symptoms, and, further, that she had never ceased to be distended by the gas which had been injected, possibly because the impaired abdominal circulation did not cause the removal of the gas as it would in a healthy person.

This plan may be said to be an illustration of a refinement of diagnostic methods which is not justified. The liver could easily have been studied in this case as to its size and shape by percussion and palpation, and so far as the patient was concerned there was no necessity of confirming the signs elicited by physical diagnosis by an *x*-ray plate taken after oxygen gas had been used in this manner.

In a paper which we have recently read in regard to this procedure, the writer states that "it has long been desired that we should have a brilliant method of showing the abdominal viscera." The question naturally arises, why should we have a *brilliant* method? This is not what the patient is seeking. The patient comes to a physician for the purpose of getting well. Because of the wonderful powers of recuperation the patient sometimes gets well in spite of what the doctor does. In some instances the doctor may do wrong because of carelessness, ignorance, or the frailty of human nature. Only the last of these is excusable. The old adage that we must be careful in carrying out diagnosis and treatment that we do no harm is too often ignored.

We think, therefore, that the sane conclusion in regard to the intra-abdominal injection of oxygen gas is that in certain very obscure cases in which a decision as to operative procedure must rest upon every detail we can possibly obtain, such a plan may be resorted to, but its employment as a diagnostic agent in this manner is very much akin to the employment of tuberculin as a diagnostic agent in human beings, which, as some one has well said, is a method of diagnosis closely allied to going into a cellar with a lighted candle to see if there is a leak in a gas-pipe. The diagnosis may be established, but the object of the diagnosis, namely, the saving of the premises, is in the majority of instances lost in the result which accrues.

Finally we may point out that the Editors of this journal more than thirty years ago carried out a research upon the influence of the intra-abdominal injection of air into

the abdominal cavity, and found that high pressures in the abdominal cavity were much more dangerous than high pressures produced in the intestinal tube. The margin between that degree of distention with oxygen gas which will serve to outline organs and that degree of pressure which is dangerous must be a very narrow one, and we venture to state that if this method becomes popular there will be a number of serious accidents as the result. We may not hear of them because such occurrences are rarely if ever reported, for obvious reasons, but we would like to suggest that in any case where this method is thought of it will be well for the physician to follow the advice often seen at railroad grade crossings, namely, "Stop, Look, and Listen."

INFECTIVITY IN ACQUIRED SYPHILIS.

Our knowledge of syphilis, its cause, its prevention, its cure, is now sufficient to make it practically possible to so control this disease that it shall no longer be one of the large problems, if not the most important one, of public health. Its control depends largely upon our ability to determine whether or not a particular patient is liable to transmit the disease, and to this problem Browning (*Glasgow Medical Journal*, July, 1920) has devoted a careful study. He points out that it has long been known that infectivity gradually lessens to the vanishing point in the course of time and treatment, but the regularity of this process has probably been exaggerated. Findlay says: "If there is one striking feature in the life-history of congenital syphilis, it is the erratic manner, both as regards incidence and virulence, in which it appears in the several members of the family of two individuals, whether one or both are syphilitic."

The recognition of spirochæta pallida by microscopic examination and the transmission of the infection to rabbits by intratesticular inoculation are methods of precision for detecting the causal agent. The latter is of great value for the discovery of the organisms when they are present initially in scanty numbers; but it gives results only slowly, since the lesions, which when developed contain abundant spirochætes, may not become marked for six weeks or longer. Further, the Wassermann reaction yielded by the blood serum is the most delicate sign so far available of generalized activity of the syphilitic spirochætes.

On account of the rapidity with which results are obtained, the Wassermann reaction is the only one of the three procedures already mentioned which is practicable for clinical purposes after the patient has passed beyond the stage of active secondary lesions, and therefore it is of the first importance to determine what relationship, if any, exists between a positive reaction and infectivity in the light of other investigations.

The infectivity of cases in the early latent period has been well established clinically; but some observers have been unwilling to concede that in syphilis a "carrier" stage might exist in which, even in the absence of gross local lesions, such as mucous patches, spirochætes were present in the secretions, thus rendering the affected individual infective. The transmission of infection, *e.g.*, to rabbits, by intratesticular inoculation has, however, demonstrated the infectivity of the blood and secretions in such cases. Thus, the blood and also the milk of an apparently healthy mother of a congenital syphilitic child, her only sign of infection being a positive Wassermann reaction, have been found infective (Ihlenhuth and Mulzer). Frühwald also has produced infections in rabbits by intratesticular injections of blood (2 Cc.) in three cases which presented no clinical signs of infection. In two of these the infection was one and 1½ years old, and there had been no treatment for eight or ten months; in both the Wassermann reaction was positive, however. The third case is especially interesting because the Wassermann reaction was negative at the time when the blood was proved to be infective.

It is clear that the infectivity of such latent cases is likely to be less serious practically than that of patients in whom there are ulcerated lesions on whose surfaces abundant parasites are present. Nevertheless, the infectivity of the latent syphilitic, especially within the first few years after infection, may be a serious factor, and, of course, when relapses occur spirochætes are abundant in the lesions.

Further evidence as to the persistence of spirochætes has been afforded by inoculation experiments with tissues excised from the site of healed chancres. The results have shown that spirochætes remain latent, but virulent, for considerable periods at the site of a healed chancre. Thus Sandmann has infected monkeys by means of such tissue removed up to fourteen months after healing; the material was taken from cases which were free from clinical signs or symptoms, and which had undergone vigorous mercurial treatment both general and local. Observations of this kind, together with the well-known tendency for the site of the chancre to exhibit reinduration, afford an important reason for excision of the primary sore where possible, since, if left, it will afford a nidus from which infection may reinvade the body later on.

Coming now to the question of the assistance afforded by the Wassermann test in cases at this period, it is found that a considerable proportion (from 25 to 50 per cent) yield a positive reaction in the absence of other signs of the disease. Accordingly, the test is an invaluable means for the detection of early syphilitics who, in the absence of a history, could not be otherwise discovered, and who at this stage must all be regarded as dangerously infective. On the other hand, a negative Wassermann reaction in the early latent period (up to four to six years after infection on the average), while affording evidence that there is not generalized activity of the infection at the time, cannot be taken as proof that the infection will not relapse subsequently. Should an early relapse occur, the case will again become actively infective. Accordingly, a negative reaction at this period cannot be regarded as a guarantee of permanent reduction of infectivity to the limit of safety. But it may be assumed, with a very considerable degree of certainty, that vigorous initial treatment, followed by milder continuous treatment, which suffices to prevent clinical manifestations, and maintains a negative Wassermann reaction, will depress infectivity to a negligible level.

With the aging of the infection profuse lesions containing abundant organisms become replaced by isolated ones in which spirochætes are extremely scanty. This restriction in number and distribution of the organisms must be ascribed to an immunity reaction on the part of the body; it takes place both in untreated cases and in those subjected to the influence of mercury (which seems only very rarely to have produced complete cure in the sense of sterilizing the tissues). The fact that the later lesions may be so much more massive than those of the early period is to be accounted for by the change in the mode of reaction which occurs in the course of the infection, and to which the term allergy has been applied. Thus, where immunity breaks down locally, giving rise to a so-called tertiary process, the increased response of the tissues leads to a relatively large lesion. The diminution in number of the parasites in long-standing infections, even in the gummatous tissue itself, is to be regarded as the principal cause of the decreased infectivity of old syphilitics. Although the individual can never strictly be considered as non-infective so long as he harbors the living virus, still it is generally believed that the infectivity of such patients is reduced to the vanishing point. While this is common experience, however, it is by no means an invariable rule, and the exceptions are sufficiently numerous to merit serious attention. It cannot be regarded as satisfactory to presume that the syphilitic whose primary infection dates back four years or more, and who has undergone an arbitrary course of treatment, is non-infective when, taking a concrete figure for the sake of argument, let us say, ten out of

every hundred such cases are infective. The physician in this matter cannot be content with statistical truth, but must endeavor, as far as knowledge will permit, to arrive at a conclusion regarding the state of the individual.

In this relation Trinchese has recorded six cases of wives infected by their husbands, whose primary infections dated back three to six years before marriage, and all of whom had been treated with mercury either alone or together with salvarsan. At the time of marriage all the men reacted positively to the Wassermann test, but were otherwise free from evidence of syphilis. The wives immediately after marriage reacted negatively, but five of them later on reacted positively, and four of them bore syphilitic children. Even at a very late period of clinical latency infection may still be transmitted. Thus, a man acquired syphilis at 25 years of age, and was treated by mercurial injections. There resulted rapid disappearance of all symptoms except slight swelling of the inguinal glands. Eight years after infection the serum gave a marked positive reaction, hence a course of mercurial inunctions was administered before marriage. Eleven months after marriage a healthy child was born, and both it and the mother reacted negatively; there were also no symptoms suggesting syphilis. Two years later there was a second healthy child, and both mother and child gave a negative reaction. Ten months after the birth of the second child the mother presented a typical roseolar rash, and the Wassermann reaction was markedly positive; the husband showed nothing but a strong positive reaction. Trinchese concludes, therefore, that a period of infectivity may supervene after a long non-infective stage.

The Wassermann reaction in these late cases may be obstinately positive in spite of treatment, and yet the patient may be practically incapable of transmitting the disease; hence there is not at this period the same intimate association between a positive result and the existence of infectivity as at the early stage. Nevertheless, in view of the evidence quoted above as to transmission of the disease by old cases, the judicious attitude would be to regard the patient as infective until he had been subjected to antisyphilitic treatment, which should be vigorous to begin with, and should be continued at least so long as the reaction remains positive. Such a procedure is, of course, desirable in the individual interest of the patient as well, and there is every reason to anticipate that the initial vigorous treatment will reduce infectivity to the margin of safety, and that continued mild treatment will maintain it at this level, so that the patient will be safe practically, even should his blood continue to give a positive reaction.

As regards pregnancy, women who have been syphilized should be regarded as permanently liable to produce congenital syphilitic offspring unless they are subjected to vigorous treatment during, as well as before, pregnancy.

FACTORS MAKING FOR A LOW VENEREAL RECORD.

Venereal infection is as great a crippling influence in civil life as it was in the army; in military life the cases are discovered and the loss of time and ability are recorded; in civil life these data are unavailable. A special study of the means by which the incidence of these infections may be lessened is always worth while, as is evidence brought to show that methods in use are either efficacious or the reverse if such be based on dispassionate clinical observation.

Ashburn's communication in the *Military Surgeon* for August, 1920, is therefore important, particularly from the standpoint of the value of prophylaxis. For some months he has supplemented his earlier study appearing in the *Journal of the American Medical Association* of December 13, 1919, bearing on a study of the subject of the low venereal rate of the American Expeditionary Forces, by a later one bearing upon the troops in the United States. This inquiry was conducted with the full coöperation of

the military medical authorities and the complete assurance to each man that his identity would be concealed. The questions asked were:

Have you had illicit sexual intercourse in the United States during the past year?

If so, how many times?

Did you always use prophylaxis after such intercourse?

If not, how many times did you neglect it?

Did you acquire venereal disease during the year?

Did it result from intercourse followed by prophylaxis?

Did it result from intercourse not followed by prophylaxis?

It is interesting and somewhat surprising to find that the percentage of men who had been chaste for a year was the same as the inquiry in France showed to have been chaste there, 34 per cent. This was surprising for the reason that the present army is the regular or professional army, recruited by voluntary enlistments, and such an army was thought to have a much smaller percentage of chaste men, and prior to the World War it almost certainly had. The change is probably attributable to the promise of education and of vocational training held out to recruits and to the attraction of a more intelligent, younger and less reckless type of recruit, and to the greater activity of moral training and of antivenereal teaching that has obtained since America entered the war. It is noteworthy that during the period of this inquiry, for the first four months of the year 1920, the rates averaged only half what they were in the army in the United States for five years prior to the war, and somewhat better than the weekly reports showed during the war.

This inquiry supports the earlier one in indicating that one-third of average white American men of military age are chaste, at least for considerable periods.

The 9483 men who admitted illicit intercourse during the year acknowledged 234,413 sexual contacts, an average of 24.8 for each man. They also admitted 879 venereal infections, while 184 men refused to answer the question as to whether or not they had acquired venereal disease. It may be assumed that practically all of them had done so, in which event 11.2 per cent of all men indulging in illicit intercourse became infected in the course of a year, and there was one infection for each 220 illicit contacts. There were 117,210 acknowledged instances of neglect of the use of prophylaxis and 384 acknowledged infections following neglect of it, or one infection in 305 exposures without prophylaxis; while there were 117,203 possible uses of prophylaxis and 407 acknowledged infections following its use, or one infection for, at most, 288 exposures with prophylaxis. In regard to the remaining 31 infections, it was not known whether they followed use or neglect of prophylaxis.

This finding was momentarily quite disconcerting, as it was unbelievable that the use of prophylaxis should predispose to venereal disease. The explanation was soon found in the fact that the men acknowledging the most frequent intercourse were, in general, not the greatest users of prophylaxis, and the assumption that many of them had mistresses whom they trusted seems to be justified by the figures. On the other hand, a separate inquiry limited to infected men, and which to the present embraces 7000 cases of venereal disease, indicates that the average number of exposures in a year for each infected man was 14.5. An attempt was therefore made to divide the unchaste men into two groups, as they probably had intercourse with mistresses or with promiscuous prostitutes. For this purpose it was assumed that men having intercourse more than fifty times in the preceding year belonged to one group, and those indulging not more than fifty times to the other. Whether or not this assumption was justified, the separation of the two groups was helpful, the result interesting, and the study of the two groups much more informing than that of the undivided whole. For convenience the groups will be referred to as the high-contact and the low-contact groups.

The high-contact group, consisting of men who admitted more than 50 sexual contacts during the preceding year, embraced only 1192 men, but these acknowledged 149,373 contacts, an average of about 125 for each man. One hundred and eight men acknowledged infection during the year, or one infection to 1383 contacts.

This group acknowledged 82,002 neglects of prophylaxis, leaving 66,371 in which it might have been used, and there were 52 acknowledged infections after neglect and 54 after use of prophylaxis, or one infection after neglect of prophylaxis to 1596 exposures, and one infection after use of prophylaxis to 1229 exposures with possible use of it.

As to the low-contact group, deducting the chaste men and those claiming to have had more than 50 contacts each during the year, there remain 8291 more men who admit having had intercourse and who also admit 671 infections. But 2332 of these men, although admitting 182 infections, failed to state how many times they had had intercourse, and practically all of them also failed to state how often they had neglected prophylaxis, the entire 2332 specifying but 43 neglects. Eliminating these cases as useless we have 5959 men who had less than 50 contacts each, who admit 85,040 contacts, 34,165 neglects of prophylaxis, and 589 infections, thus showing an average of 14.2 contacts per man and one acknowledged infection to 144 exposures. Ninety-nine men in this group failed to state whether or not they had acquired venereal disease. The assumption that they had would bring the total of infected men in the group to 688, or 11.5 per cent of the group, and would show one infection to 123 exposures, a figure agreeing remarkably with the results of an inquiry which thus far embraces 7000 infected men and which shows an average of 14.5 exposures during the year for each infected man.

Of the 589 infections admitted by this group 295 followed use of prophylaxis and 283 followed its neglect. In 11 instances this information is not furnished. There was one admitted infection after neglect of prophylaxis to 120.7 exposures, and one admitted infection after its use to 172.4 exposures, indicating that the use of prophylaxis reduces the liability to infection by 30 per cent. This agrees strikingly with the results shown by the inquiry answered by 7000 infected men, in which instance the decrease of infections to exposures was 29 per cent—*i.e.*, there were 11.3 unprotected exposures for each infection without prophylaxis, compared with 15.9 exposures with prophylaxis for each infection following its use.

This inquiry supports the belief that chastity is the most important factor in producing low rates. It also supports the belief that chastity is largely influenced by public opinion, and in the army by the official attitude in regard to it.

Illicit intercourse appears to be much less dangerous in the United States than it was in France, although it is admitted that the means for estimating its dangers in the A. E. F. were not so good as those presented in this inquiry. It certainly appeared, though, that there was much greater promiscuity abroad than here, which would of course make for higher infection rates among both men and women. A factor of possible importance is that the attitude of American communities is much more unfavorable to the existence of houses of prostitution than is that of France.

Medical prophylaxis of venereal disease appears less effective than the A. E. F. inquiry indicated, but still worth while. Ashburn's estimate was that there was one infection following 30 exposures without prophylaxis, and one following 90 exposures with it, figures widely varying from those obtained here; but it is noteworthy that Col. George Walker, as a result of an investigation covering 240,000 prophylactic treatments given in France, concluded that 1.3 per cent were followed by infection, or one infection to 77 contacts followed by prophylaxis; so it appears that sexual contacts there were really more dangerous than here. There is little doubt

in Ashburn's mind that the exaggerated claims made as to the efficacy of prophylaxis in the A. E. F. did harm, by removing from many men wholesome fear of venereal disease, by giving some men the idea that illicit intercourse was sanctioned, and by causing others to lose faith in prophylaxis and to cease using it when they saw many of their comrades contract disease after its use.

All medical men should take to heart the lesson of the importance of having a basis of comparison when trying to estimate the value of prophylactic measures. A basis of comparison for American use, and which should stand until refuted by more thorough study, is herein furnished.

For months it was claimed and taught that venereal prophylaxis was 99 per cent efficient because approximately only one exposure out of a hundred was followed by venereal disease after its use. According to A. E. F. figures only 3½ infections per hundred would follow without any prophylaxis, and according to this inquiry only one in 120.

The truth about prophylaxis is worth telling; exaggerations are harmful.

Prophylaxis is enough efficient that it should be used after any illicit intercourse; it is not so efficient as to justify any man in assuming any risk of infection and counting upon use of it to compensate for his lack of self-control.

REPORTS ON THERAPEUTIC PROGRESS.

POISONING BY ARSENOBENZOL COMPOUNDS USED IN THE TREATMENT OF SYPHILIS.

FOULERTON, in the *British Medical Journal* of June 26, 1920, states that three questions of practical importance remain to be considered on the recognition of these cases of poisoning: (1) As to the general risk of poisoning in the treatment of syphilis, malarial infections, and other diseases with arsenobenzol drugs; (2) as to whether the use during the war of other arsenical products in substitution for the "606" of German manufacture, which was in common use before the war, has been in any way responsible for the occurrence of poisoning; and (3) as to whether the so-called "intensive" treatment with arsenobenzol compounds, in combination with intramuscular injections of mercury, which came into vogue during the war, has had any influence in the direction of increasing the risk.

The risk of poisoning inherent in treatment by arsenobenzol drugs cannot be appreciated closely at present. The drugs were used in the treatment of unprecedented numbers of cases during the war, because of the military advantage gained by a shortening of the period during which a man with syphilis has to be kept out of the line; and it is certain that the deaths from poisoning by these drugs which have been recognized and recorded hitherto constitute only a fraction of the number of deaths due to this cause which have occurred during the last six years. This must necessarily be so; because the drug has not been recognized as a possible cause of the toxic symptoms which have been described, and because of the frequency with which a period of apparent good health intervenes between the completion of the treatment and the appearance of those symptoms.

Since these special toxic effects of the arsenobenzol drugs were not recognized during the period when "606" was in common use in this country, it is not possible at present to form any opinion as to whether the arsenical compounds which have been used in succession are more or less toxic than the original drug. As, however, the use of "606" was continued elsewhere during the war, and since the special dangers have come to be recognized, it is possible that some information on this point may be forthcoming later on. But with the effects being caused by the essen-

tial arsenic, with probably some intensifying action of the benzene constituent, one might, perhaps, infer that when further information has been obtained it will not prove that the precise proportion of the two ingredients has been of material importance in influencing the toxic action of the drug.

With regard to the effect of the "intensive" method of treatment, apart from the conjoined use of mercury, there is not much to be said. It is difficult to trace in recorded cases any correlation between the actual amount of drug administered and either the time of onset of symptoms or the severity of those symptoms. The clinical course of the symptoms appears to be remarkably constant in a large majority of the fatal cases, which are the only ones of which we have as yet any definite information. In the cases of delayed poisoning the symptoms have occurred usually after the completion of a course of treatment, and when a full amount of the drug has been administered; but a precisely similar course of events may intervene during the course of treatment and after the injection of only two or three comparatively small doses.

The possible effects of the action of mercury on a liver which may be already damaged more or less by the toxic action of the arsenical preparation require special consideration. It is a common belief in therapeutics that mercury has some sort of stimulating effect on the liver cells. The condition of the liver in experimental poisoning with mercury has been described differently by various pathologists. Burmeister and McNally and others describe marked histological changes of a progressive nature in the livers of dogs poisoned with mercuric chloride, but the changes described have not included any of a fatty nature. Practically all observers agree, however, in describing an acute nephritis in experimental mercurial poisoning with the occurrence of fatty changes in the tubal epithelium.

It is evident, therefore, that mercury in large doses has by itself a definite action on the liver tissue, and that its administration in even the moderate doses used with the "intensive" method of treatment may have an injurious effect on a liver already damaged somewhat, with consequent impairment of its functional activity by the arsenical drug. That such possible unfavorable influence would be of a merely incidental or accessory nature, and not essential, is shown by the fact that mercury had not been administered in at least three out of his series of sixteen cases. Nevertheless it is advisable that the use of mercury in conjunction with arsenic should be discontinued; the more especially so in that it is difficult to understand in what way the additional treatment can have any useful effect under the conditions.

Taking a broad view of the matter in the light of the experience which has accumulated up to the present time, it has to be admitted that there is a certain definite risk in treatment with arsenobenzol compounds. It is impossible to express the risk in any individual case in the terms of a percentage; but the danger is sufficiently real to suggest that a man who is going through a course of treatment should be kept under careful medical regimen throughout the period of administration of the drug and for some weeks afterward. It is scarcely necessary to say that complete abstinence from alcohol should be compelled; the diet also should be so regulated as to lighten the work of the liver as much as possible. The diet which would appear to be advisable during the course of treatment is the same as that recommended both for the prevention of poisoning by trinitrotoluene amongst munition workers and in the treatment of cases in which symptoms of poisoning have already occurred.

The administration of milk or any other fat food in the course of treatment of declared poisoning is inadvisable. Whatever may be the exact causation of the disease of the liver two facts are outstanding. In the first place the liver functions become seriously disordered, so that the gland is no longer able to carry out effectively its

part in fat metabolism. In the second place, a condition of excessive lipemia is established. As in preventive treatment sugars should be substituted for fat foods, definite doses of glucose being given together with fruits. The sugar given thus is not only in substitution for fatty foods, but also because of theoretical considerations which suggest that oxidation of the excessive floating fat will be favored by its administration. The diet, then, should consist mainly of carbohydrates, with very small quantities of lean meat, or perferably fish—excluding the fatty kinds, such as herring, mackerel, etc.

HOW AGAR IS PREPARED.

NAKAMURA, in the *Bulletin of Pharmacy* for July, 1920, reminds us that agar-agar is obtained commercially from marine algæ, or water-living plants, found on the Asiatic coasts of Japan and China. The plant *Gracilaria lichenoides* grows along the coast, especially where it is rocky and rough, attaining a height of from two to eight inches and branching out to about the same lengths. It seeds every month, so that in Japan, where the plant is getting scarcer and scarcer, the natives throw rough stone or gravel into the sea in order to afford a germinating place for the seeds. Divers gather the weed from deep places, and women and children are able to get at it in the shallow spots.

Japanese divers go south along the Riukiu Islands to Formosa, and north from Yesso along the Kurile Islands to the Behring Sea. The algæ is dried and then put in bales and sent to the factory. At the factory the seaweed, which is very black, is first rinsed in cold water and bleached in a solution made by passing an electric current through sea water.

The bleached algæ is washed several times and then boiled for about two hours, after which it is strained through muslin and allowed to gelatinize in long pans.

The next process is to put the gelatinized mass through a cutter, which slices it into long strips. The strips then go to a refrigerator cooled to a temperature of about 20 degrees below zero, this for the purpose of imparting a fluffy texture to the agar.

As a final step the strips are passed through a drying room, after which they are either made into bundles or granulated, preparatory to shipment abroad.

Because the employment of agar-agar in the industries and in medicine is gaining headway at such a rapid pace, it is only a question of time until the Asiatic supply will fail to equal the demand. A future source must be the United States, and American botanists and chemists should be encouraged to make a thorough study of the possibilities. Nakamura has reached the conclusion that this country has vast beds of marine algæ on both the Atlantic and Pacific coasts.

A species discovered by the writer and not yet named has marked mucilaginous properties and can be made to gelatinize. The gelatin obtained in this way can be spread on bread like jam and, with the addition of fruit flavors, may later revolutionize the jam and jelly industry.

THE INFLUENCE OF X-RAYS IN THE DISEASES OF THE SKIN.

SCHAMBERG, in the *American Journal of Electrotherapeutics and Radiology* for July, 1920, states that in ringworm of the scalp the *x*-rays have been shown to be of great value. In this condition the fungus obtains entrance into the hair follicle and invades the hair structure. The *x*-rays by producing a rapid depilation cause the extrusion of the fungus and a rapid cure. This treatment was first introduced by Sabouraud of Paris. It requires very accurate dosage and skilful treatment to produce the depilation after one séance, without causing permanent loss of hair.

This treatment is even more justified in that unfortunate disease known as favus, which is due to a similar fungus. This disease occurs extensively in Russia, Italy, Ireland, and the East, and but rarely in natives of this country. Our immigration laws require the deportation of all cases

coming to these shores. The disease destroys the hair and causes ulceration of the scalp.

Ringworm, when it gets well, does not destroy hair, and one is not justified in using any measures which will lead to permanent loss of hair. Schamberg cites the case of a child treated in another city whose entire calvarium was as bald as a billiard ball as a result of the unskilled use of the rays.

He says that if he were deprived of the use of the *x*-rays he would fail to cure many cases of eczema which now go on to most satisfactory results. In chronic papular eczema of the face, and particularly in the recurrent vesicular eczemas of the hands and feet, the results from *x*-ray treatment are admirable. The word eczema is of course an all too embracing term. Its scope is constantly being cut down. Many cases of scaling and redness and vesiculation of the hands and feet formerly regarded unquestionably as eczema are now known to be due to a fungus similar to that of ringworm. These cases are called eczematoid ringworm. They do not yield well to the *x*-rays, but respond promptly to parasiticide remedies.

In the condition known as sycosis vulgaris or common sycosis, a papulopustular affection of the beard, occurring in patients who have a vulnerability to staphylococcic infection, the *x*-rays constitute our best remedy. Here again, however, the treatment should not be carried to the point of producing degenerative effects. Schamberg is firmly convinced that better results will be achieved by us with vaccine treatment in this condition when we learn the best method of preparing vaccines. A brilliant and permanent cure was effected by two injections of an autogenous vaccine. He has never been able to repeat this result, and he is sure that the cure was due to an accidental variation in the preparation of the vaccine used.

The *x*-rays are at times used on obstinate patches of psoriasis. Of course, such a method of treatment does not cure the disease but merely temporarily removes the treated patches. If dermatitis and degenerative effects are produced they prevent the later use of chrysarobin, which is a powerful and excellent local application. Care should be taken in the use of the *x*-rays in conditions in which the rays do not cure, but are merely a helpful supplement to other measures.

A condition on which the *x*-rays exert a most happy and curative effect is plantar warts. These occur upon the soles of the feet and cause the most excruciating pain. A few properly timed exposures remove the warts.

In pruritus ani and pruritus vulvæ the *x*-rays are often of great value in relieving the intolerable itching. The curative effect is greater in the latter than in the former condition; where pruritus ani is due to a toxemia good results can often be obtained by using the rays and other approved remedies.

PHARMACOLOGICAL STUDIES ON ARSPHENAMINE.

SMITH, in the *Journal of Pharmacology and Experimental Therapeutics* for June, 1920, reaches the following conclusions:

1. The rise in pulmonary pressure produced by intravenous injections of arsphenamine is shown to be due to an obstruction of the pulmonary vessels. The nature of the obstruction is chiefly mechanical if arsphenamine dihydrochloride is injected. With alkaline solutions the obstruction may be due largely to a mechanical blocking, or to a constricting action of the pulmonary vessels, depending upon the amount of alkali used in making the solution.

2. The cardiac dilatation following the intravenous injection of arsphenamine does not appear to be a direct effect of the action of the drug, but rather secondary to the pulmonary obstruction, causing the right heart to work under undue strain and, secondarily, to dilate.

3. The toxicity of various arsphenamine preparations, as determined by their circulatory effects in the dog, varies considerably.

THE ACTION OF CHLORAL ON THE PUPIL.

HYATT, MCGUIGAN and RETTIG, in the *Journal of Pharmacology and Experimental Therapeutics* for July, 1920, in a summary of their experiments point out that the statements made regarding the condition of the pupil in chloral poisoning are contradictory. It is known that small doses (1 gramme) in the human being produce a condition resembling normal sleep. In this condition the pupil is slightly contracted. This is due to removal of the inhibitory effects of the higher centers from the oculomotor center. They have shown that large doses of chloral may produce a pinpoint pupil. Definite experimental evidence is given to show that no part of the mechanism of the eye peripheral to the ciliary ganglion is directly acted on by the chloral, and that neither the ciliary nor sympathetic ganglia are involved. The action is therefore central and due to removal of inhibitory influences which are normally active. Strychnine, caffeine, atropine, and other centrally acting drugs are antagonistic to the action of chloral.

CLINICAL RECOGNITION OF SYPHILIS AND THE SYPHILITIC.

GRAVES, in the *American Journal of Syphilis* for July, 1920, states that in examining a patient the first thing to be decided is whether or not the individual is syphilitic, and secondly, if the patient is syphilitic, whether or not the disease or condition which the patient presents is due to the syphilis. If laboratory work has led us astray, it has been chiefly in regard to this second point; for, granted that the patient is syphilitic, it is by no means certain or positive that the condition he comes for is one due to syphilis. Again and again patients come with some obscure condition, a Wassermann test is made, and if it is positive one is apt to conclude that the condition is due to syphilis. Again and again tuberculosis is found in syphilitics, and the question of calling the pulmonary lesion syphilis practically never arises, as tuberculosis is such a common and well-recognized disease. While the presence of a syphilitic infection may lower the resistance to any other infection and thus bring about a relationship between the two, such as is seen in the association of tuberculosis and syphilis, it is most important that the two diseases be differentiated, and it is just here that the recognition of syphilis from the clinical standpoint is most important.

TREATMENT OF ACUTE POLYARTHRITIS.

BOORSTEIN, in the *Medical Record* of July 17, 1920, concludes his contribution as follows:

1. The disease has no relation at all to rheumatism, and antirheumatics should be avoided.

2. A focus of infection should be looked for in every case of arthritis where tuberculosis, malignancy, or trauma is not self-evident. The finding of one focus does not mean that this is the only one. The source of infection suspected should be removed if possible.

3. A monoarticular arthritis demands the same careful investigation as does a case of polyarthritis, because it is not possible for any one to tell when the former may merge into the latter.

4. Prophylaxis in preventing any systemic infection and keeping the genitourinary and intestinal tracts in good condition is essential. Removal of chronic foci anywhere in the body is imperative as a prevention of progressive ill health.

5. The arrest of infection does not mean that the joint will be cured, unless orthopedic measures are employed.

6. General treatment, such as good hygiene, good food, tonics, and building up of the patient, is essential to success.

7. Acute joints should be put in well-padded plaster casts for rest.

8. When active symptoms subside, local treatment to the joints, in the form of active and passive hyperemia, hydrotherapy, massage, active and passive exercises, should be administered regularly with great

care and patience and kept up for a long time.

9. The occurrence of deformities should be prevented by steadying the joints in proper position at the time of the acute infection.

FROELICH'S SYNDROME.

BECK, in *Endocrinology* for April-June, 1920, states that the advancement along the lines of therapy in pituitary disease has kept pace with the progress made in the study of the physiology and symptomatology. Treatment has become more rational, and, as in the case of disorders of other glands of internal secretion, organotherapy is most efficacious in the deficiency syndromes.

In hypopituitarism these include:

Anterior Lobe Deficiency—(1) Disturbance of growth (infantilism). (2) Development of obesity (dystrophia adiposogenitalis). (3) Genital hypoplasia (infantile genitalia with frigidity, sterility, and amenorrhea). (4) Temperature anomalies. (5) Cachexia hypophysopriva.

Posterior Lobe Deficiency—(1) Hypotension. (2) Increased sugar tolerance. (3) Diminution of basal metabolism rate.

In addition there occur pressure symptoms—headache, vertigo, vomiting, etc.

Polyuria (diabetes insipidus), which was formerly attributed to posterior lobe deficiency or hypoactivity of the pars intermedia, is not included in the above classification of symptoms, owing to the results of the clinical and experimental studies of Houssay and Leschke mentioned previously.

Fortunately most of these indications, if they can be influenced by treatment, are controlled by the administration of the hormones of the thyroid, pituitary and gonads, either singly or combined. The thyroid is probably the most important. This gland has been called a sex gland because it is a powerful stimulant to the sex organs; and the presence of the thyroid hormone as well as the pituitary is essential to normal function of the gonads. The thyroid is the greatest stimulator of metabolism known, acting, probably, by its effect in increasing muscle tonus through irritation of the autonomic nervous system. The thyroid is also a stimulator of the pituitary function. It is thus easily conceivable how thyroid extract would favorably influence the majority of the groups of symptoms above mentioned. Through its influence on metabolism it has a tendency to improve the fat dystrophy, decrease sugar tolerance, and increase the rate of basal metabolism. The changes in the metabolic rate will favorably influence the subnormal temperature, slow pulse, hypotension, dry skin, etc. Through its accelerating influence on the pituitary and sex glands it will augment the effect of pituitary and ovarian extract upon sexual hypoplasia and hypogonadism, as well as on infantilism of hypophyseal origin.

Anterior pituitary lobe has its greatest value in cases of dystrophy adiposogenitalis. In combination with thyroid it has the effect of redistributing the fat and increasing the functional activity of the sex glands, besides correcting some of the anomalies due to hypoplasia of the genitalia.

Most of these cases are not pure hypopituitarism; symptoms referable to thyroid and ovarian deficiency are frequently present. It is owing to this fact that better results are obtained by combining the respective hormones than by giving them singly.

In a study of a group of cases with hypophyseal fat dystrophy it has been Beck's experience that mere loss of weight is no adequate criterion as to the effect of treatment on the fat dystrophy. Patients under treatment must be systematically measured and measurements recorded. The most striking example was a woman whose hip circumference was reduced 7½ inches while under treatment, without her losing weight. By measuration it was definitely established that the fat is actually redistributed in certain types of these patients. As a rule the measurements of circumference increase from the waist up, and decrease from the waist down. The dose employed in the treatment of these cases

was 2½ grains of anterior pituitary lobe (Parke, Davis & Co.), two or three times a day, and thyroid from one-half to one grain two or three times a day. Small doses of ovarian or testicular extract were added in some cases. To his mind the latter is of doubtful value.

The chief symptom of diabetes insipidus, which is occasionally associated with hypopituitarism, can best be controlled by the hypodermic administration of extract of the posterior lobe and infundibulin. In his experience he has found that 1 Cc. of pituitrin every day or two will absolutely control this annoying symptom, but the amelioration is only temporary. The remarkable effect of a single dose of 1 Cc. pituitrin promptly reducing the 24-hour urine from 13,000 Cc. to 1800 Cc. the next day led to the view that diabetes insipidus is due to posterior lobe deficiency; the oral administration has no effect.

The so-called pituitary headache is often promptly relieved by the administration of pituitary extract; Pardee recommends whole gland in doses of ½ to 2 grains three times a day. When the headache is relieved the dose is diminished. Timme in his article on a "New Pluriglandular Compensatory Syndrome" lays stress on the importance of recognizing these cases at their onset, when the best results are obtainable by the early administration of pituitary substance. He considers pituitary gland almost a specific. The whole gland in doses of 2 to 3 grains, three times a day, is given in appropriate cases. This he supplements at times with pituitrin hypodermically, 0.5 to 1 Cc. per day or alternate days, for one or, at most, two weeks. With genital delay he occasionally feeds anterior pituitary lobe, which gives fair results. Atropine is recommended in those cases with vagotonic symptoms. Timme states that pituitary feeding in itself alone produces highly satisfactory improvement in almost every case; headache disappears, fatigue diminishes, blood-pressure and blood sugar content increase.

The whole gland substance is indicated in cases with symptoms of both anterior and posterior lobe deficiency. With the use of thyroid and pituitary, de Schweinitz and How obtained good results in a case of pituitary disease with the onset of blindness; vision was restored. Other observers reported similar results. The feeding of pituitary substance exerts a favorable influence on the cachexia. Cases are reported in which the symptoms were entirely relieved.

Except for the fact that operations on the hypophysis are fraught with considerable danger, the mortality rate being 10 to 16 per cent, the indications for surgical treatment of disease of this gland would be practically comparable to those for diseases of the thyroid. The complete removal of the gland or any process which totally destroys the substance will lead to the condition known as cachexia hypophysopriva; operations, therefore, are restricted largely to tumors and are resorted to more frequently in conditions associated with hyperfunction.

SCLERODERMIA AND PITUITARISM.

The *Lancet* of July 17, 1920, in an editorial on this subject states that in 1917 Alibert described for the first time under the name of scleremia a morbid syndrome characterized by cutaneous sclerosis, afterwards renamed sclerodermia. Although its association with other affections, such as myxedema, exophthalmic goitre, and the frequent occurrence of pigmentation have suggested a theory of a plurality of sclerodermic forms, little has been achieved in lifting the veil which surrounds its true pathogenesis. With the prevalence of new views regarding the importance of the endocrine glands, theories of the pathogenesis of sclerodermia naturally gravitated toward these fresh ideas, and invoked as causative agent changes in the thyroid, pituitary, or suprarenal capsule. We are indebted to Izar for the publication of a case with full details, which throws some light on the causation of sclerodermia and its relation to pituitarism.

The patient was a girl seven years of

age, who developed an extensive sclerodermia on the neck, face, thorax, and anteroexternal surface of the limbs. The cutaneous thickening was so great that the child resembled a wax doll. The mother and sister were short and fat, suggesting the pituitary type, and a radiogram of the child's skull showed some enlargement of the sella turcica. But the chief interest of the case lies in the result of the pharmacodynamic reactions. For instance, neither adrenalin, pilocarpine, atropine, endothymin, endothryoidin, nor endo-ovarin gave rise to any reaction worthy of mention, while on the other hand injections, both of total pituitary extract (hypophysin) and of pituitrin, in doses of ¼ to ½ Cc., induced rise of temperature, increased arterial tension, and slowing of the pulse to a marked degree. With this positive reaction a therapeutic course of pituitary extracts was commenced, with the result that after the sixth daily injection of ½ Cc. the sclerodermic lesion began to recede. By the forty-ninth day after 16 injections of hypophysin and 16 of pituitrin, there only remained some pseudo-edema on the neck, forearms, and legs, and treatment was continued by the administration of half a tablet of Byla's hypophysin on alternate days by mouth. All signs of the skin affection had disappeared at the end of six months.

The striking and beneficial action of this opotherapic cure would seem to establish without doubt the pituitary origin of the cutaneous lesion in this case.

THE REACTION OF THE CARDIOVASCULAR APPARATUS.

Smith, in the *American Journal of Syphilis* for July, 1920, in his conclusions states that:

1. Cardiovascular lues develops primarily in the secondary stage of the disease.

2. The heart should be carefully watched in the acute stage of syphilis as it should be in a case of acute rheumatic fever.

3. If the heart and vessels be so watched, the early cardiovascular lesions can be detected in the majority of cases, and thereby the late fatal affections probably prevented through sufficiently intensive and prolonged treatment.

4. A sufficiently large percentage of cases of chronic myocarditis are of luetic origin to force the clinician to search carefully for syphilis in all such patients that they may enjoy the beneficial effects of specific treatment even in doubtful cases.

5. Syphilis probably plays a not insignificant rôle in the etiology of arteriosclerosis and in the more rare affections, as angina pectoris, heart block, and Stokes-Adams syndrome.

PHARMACOLOGY VS. PRACTICAL THERAPEUTICS.

Sir Clifford Albutt, in his Presidential Address before the British Medical Association, 1920, on "The Universities in Medical Research and Practice" (*British Medical Journal*, July 3, 1920), states that scientific therapeutics are not to cast out empirical methods. The compass of large principles is often too wide for daily needs. We want theories within theories, axioms of less scope but more readily adaptable to the wantonness of life. Very true; but also the craftsman must bow his head to the deeper and wider principles which will eliminate the inessentials, and economize the direction of his work. If the family physician must be rather receptive than productive, by the diffusion of scientific knowledge, and increasing familiarity with the spirit of science, the climate of thought will be changed throughout the profession.

The better class of general practitioner of fifty years ago was rather after the kind of Hippocrates, or of Paré, than of the modern graduate. His university, in the days before great cities—the "great wens" of Cobbett—was nature; in his clinical experience he enriched the instruction, half empirical, half dogmatic, of his medical school by the shrewd, observant, self-reliant, resourceful qualities of the naturalist. His science and his practice were of the naturalist, not of the biologist. In his early days a country drive with such a

doctor in Yorkshire used to be one of the rewards of the consultant; and a bedside talk with him a lesson in quickness of wit and hand, and of instructive inference and prognosis. He was as clever as the modern cardiologist in knowing when to give digitalis, when to withold it; if he were content to diagnose a case as "some bedevilment of the liver," his rules of thumb were not without their efficacy, and his *flair* for the issues of disease marvelous. He did not come across much "science," and what he did see of it, chiefly in casual "locums," did not attract him; for in truth half-science was less useful to him than whole craftmanship. He was a woodland guide, not a geographer; but, as Aristotle and Darwin well knew, the woodlander gathers much curious lore. However, in the march of intellect this comrade, kindly and loyal as he was, is gone; and his sort of wisdom dies with the individual. Who is to come next? The official doctor, or a family physician more intellectual and no less independent?

An official doctor would be as alert and as progressive as a country parson, whose service is not much kindled by the chances of promotion to an archdeaconry or a bishopric; while to shift an official doctor from place to place would be to cut the inner threads of those intimacies which we are now declaring to be clews to the detection of diseases at their sources. Yet, as things are, the independent practitioner is isolated; even in a town he is apt to make a little orbit for himself, to drift out of intimacy, perhaps into some jealousies, with his brethren; he lacks mental incentive, and gradually lets slip occasions of scientific reunion and renewal. Indeed, he cannot readily leave home to attend public and scientific meetings, so that too often—as Morant complained—"medical men do not think nor express themselves in a statesmanlike way." His time even at home is so broken up that he loses the habit of study. He may leave his hospital school full of ardor and in rapid growth, but in practice his ardor cools and he drops into routine; or at any rate such is his peril, and so less and less may the doctor feel himself a member of a great profession; he may drift out of public affairs, his outlook and sympathies may shrink, his work become a trade, and his medical neighbor his "opponent."

Again, for some years past a few of us have been protesting against the clipping of family practice by official shears. We see the subjects of infectious fevers carried into isolation, and the tuberculous and syphilitic disappearing with them. The children are turned over to the school doctor, the parturient woman to the new midwife, and so forth. What is to be the end of this pollarding of family practice? Are its branches to be scattered about in a wilderness of "specialists," and the family physician a mere sweeper up of unconsidered trifles?

BENZYL BENZOATE IN PERSISTENT HICCOUGHS.

MACHT, in the *Medical Record* of July 24, 1920, says not only is benzyl benzoate a useful remedy in the treatment of certain persistent forms of hiccoughs, but it is also of a diagnostic interest in differentiating between the hiccoughs of a purely central origin on the one hand, and those which are due to some peripheral origin on the other. Inasmuch as benzyl benzoate exerts its chief effect peripherally on the smooth muscle structures, he is inclined to believe that this drug may be most useful in the treatment of hiccoughs of peripheral origin.

In administering the drug he finds the most convenient method to be the one originally described by him in his earlier papers. The benzyl benzoate exerts its action best when given in a 20-per-cent solution in alcohol. Of this solution the patient is directed to take 20 to 40 drops in water or milk. He has not found it either convenient or advantageous to administer the drug in suspension in various elixirs or syrups, and administration in capsules has been found by him in some cases to produce local irritation, and in

others to render the therapeutic action too slow. To children the solution can be conveniently administered in sugar-water or milk.

It is hoped that this brief note may be helpful to the general practitioner in the treatment of the condition, which is not only disagreeable but may sometimes assume an alarming form.

THE TREATMENT OF DYSPHAGIA IN TUBERCULOUS LARYNGITIDES.

The *New York Medical Journal* of July 17, 1920, in an editorial on this subject, says that dysphagia is one of the most common symptoms of tuberculosis of the larynx, at least at the terminal phase of the process, and is one of the difficulties encountered in the care of those unfortunate patients who are unable to eat, and contributes toward making tuberculosis of the larynx one of the most distressing affections with which we have had to deal. Its causes reside in the edema, or rather the infiltration of the upper structures of the larynx—epiglottis, arytenoids, and arytenoepiglottic folds—with or without ulceration.

The sensory nerve, whose territory corresponds with the laryngeal vestibulum, is exclusively the superior laryngeal which, before penetrating into the cavity of the larynx, passes very superficially between the lower border of the os hyoid and the upper border of the thyroid cartilage. If the examiner pushes the left side of the larynx with the finger of the right hand, the thumb of the same hand will distinctly feel the large horn of the hyoid, the horn of the thyroid, and the free thyrohyoid space. A little stronger pressure over this area, especially on the diseased larynx, will at once give rise to rather sharp pain, shooting to the external auditory canal, on account of the superior laryngeal nerve being directly under the examiner's finger.

The dysphagia can be controlled in most cases by regional anesthesia, and the best procedure consists in pricking the nerve at the point where it underlies the skin, and injecting a few drops of 85-per-cent alcohol along the nerve. There is a sharp pain at first, extending to the ear, which proves that the injection has reached the proper structures. The pain lasts but for a few seconds, and is followed by a complete analgesia and the entire disappearance of the dysphagia. The effect on both the mental state and the physical condition of the patient is naturally considerable. It is curious to note that the edema and infiltration diminish and the mucosa assumes its normal volume. On the other hand, the laryngeal lesions can be directly treated and the patient properly fed.

This anesthesia may last for several months following a single injection, in other subjects the amelioration is for only a few days, but it often happens that after six or seven injections a permanent anesthesia ensues. This treatment is practically devoid of danger if the operator exercises a little care, and does not require any special technical knowledge other than the requisite amount of knowledge of regional anatomy which every practitioner should possess.

BENZYL BENZOATE IN THE TREATMENT OF WHOOPING-COUGH.

In the *New York Medical Journal* of July 24, 1920, McMURRAY states that satisfactory and immediate results can be obtained in the treatment of whooping-cough by the use of benzyl benzoate. The dose given is from five to thirty minims every four hours, depending upon results. In some cases decided improvement was noticed from the smaller dose, in other cases larger doses were employed. In almost every instance the treatment determined subsidence of the paroxysms.

The effect usually made itself felt within forty-eight hours, and in one instance there was relief after the second dose. As a rule the relief is immediate and complete. Although it is necessarily somewhat difficult to estimate the efficacy of a remedy in such a capricious disease as whooping-cough, he concludes from his experience

that it not only does in many cases afford immediate relief of severe spasms of coughing, but it also seems to lengthen the interval between attacks. As far as he knows, this treatment gives rise to no undesirable results. He gave twenty minims to a child twelve months of age with no evidence of gastric or any other disturbance.

PLEURAL REFLEX SYNCOPE.

The *British Medical Journal* of July 3, 1920, in commenting editorially on this subject, states that it has long been taught that syncope and death may arise from irritation of the pleura, even from so gentle a stimulus as irrigation of an empyema cavity. The experiences of war have taught us that the chances of an untoward happening from such reflexes are in reality very small. We know that a thoracotomy may be performed, the ribs spread apart, the lung handled as if it were intestine, and rents in it explored and sutured, with surprisingly little shock to the patient. Further, we know that Carrel-Dakin tubes may be placed in empyema cavities and frequent instillations be made. Bismuth can be injected into such cavities for the purpose of determining their size, position, and shape, and provided that the cavities are not overfilled no harm is done.

All these experiences have engendered a certain contempt for the old doctrine of the danger of reflex syncope through the stimulation of the rich subpleural nerve plexus which pours its impulses into the vagus. To a certain extent this contempt is well founded, but, lest any should suppose the old warnings are no more than old wives' tales, alarming little accidents from time to time occur. They usually pass unrecorded, but two cases recently reported in the French literature have a bearing on this point. Montaz describes the case of a soldier wounded by a shell fragment in the right chest. The man presented signs of shock out of all proportion to the extent of the anatomical injury. The usual resuscitatory methods were of no avail, and operation was undertaken. Very little damage was found inside the chest; the entrance wound was excised and closed. A small piece of shell was known to be lodged in the rib "grille" behind, but was not sought, as it was believed to be doing no immediate harm. A little later, twelve hours after he was wounded, the patient died. At necropsy a piece of shell with sharp edges was found projecting by 1.5 cm. into the pleural cavity at the level of the sixth rib. Montaz ascribes death to vagus reflex from the irritation of the pleura by the shell fragment. He compares his case with one previously published by Pierry. Here a patient with a chest wound of apparently no great severity died suddenly during a radioscopic examination. Post mortem, a medium-sized hemopneumothorax was found, but the fourth rib was badly broken and the sharp fragments presented like needles to the surface of the lung. These two experiences, whilst falling short of absolute proof, support the belief that the pleural reflex is an entity not altogether to be forgotten.

PHARMACOLOGY AND THERAPEUTICS OF QUININE.

The *British Medical Journal* of July 10, 1920, in referring to a discussion of this subject before the Section of Medical Sociology of the British Medical Association, states that after having referred briefly to the chemistry of quinine, Professor Dixon proceeded to show the relationship between the mother substance itself and its newly studied derivatives. The pharmacological action of these substances, he explained, was not specific to any single tissue or group of tissues, but consisted of a general depression of metabolism. In producing this effect the quinine derivatives were in many cases more potent agents than the parent alkaloid. This was illustrated by their toxicity to protozoa and to bacteria, and by their paralyzing influence on sensory nerve endings. Professor Ramsden gave an account of experiments showing that when quinine was added to the blood it existed in greater concentration in the plasma

than in the corpuscles; he referred also to the capability of the kidney for secreting enormous quantities of quinine without showing any sign of damage.

Major Acton summarized his experience in the treatment of malaria with cinchona alkaloids other than quinine; promising results had been obtained with both cinchonidine and quinidine. Sir Archibald Garrod regarded quinine as a contributing factor in the onset of blackwater fever in certain cases. Dr. F. S. Hele mentioned experiments showing that the rate of excretion of quinine in cases of blackwater fever was similar to that observed in the healthy subject. He made a comparison between the reaction of the organism to quinine and the protective synthesis and excretion observed in the case of other poisonous ring compounds. Sir Leonard Rogers gave an account of his researches on the administration of alkaloids, and recommended the intravenous injection of acid hydrobromide of quinine in severe and dangerous infections, and intramuscular injections of cinchonine in less severe cases. Dr. McWalter regarded quinine as useless as a prophylactic against malaria, and Dr. Wenyon pointed out the value of experiments on plasmodial infection in birds. Replying to Dr. McWalter, Sir Leonard Rogers quoted historical evidence that quinine prophylaxis was of real value. Professor Gunn referred to promising results he had obtained with two new alkaloids—harmaline and harmine—particularly in cases of relapsing malaria.

Dr. Dale quoted an instance in which a course of emetine brought about a complete cure of dysentery in a human subject, but was without effect on the same strain of *Entamœba histolytica* transferred to a kitten. The effect of a drug on a parasite was sometimes determined to a great extent by the host. Dr. Dale further pointed out the important possibility of using other cinchona alkaloids in place of quinine, and its relation to commercial policy concerning cinchona planting.

Colonel McCarrison recommended the use of adrenalin for the prevention of a dangerous fall of blood-pressure during injection of quinine. Dr. Bodman suggested that quinine injections might be more effective if accompanied by the administration of plain saline to increase the fluidity of the blood. Dr. Wenyon, also in reply to Dr. McWalter, spoke in favor of quinine prophylaxis.

In concluding the discussion Professor Dixon referred to the harmful effects of strong solutions of quinine salts on muscular tissue. The discussion was useful and interesting, though it left many of the points he had raised untouched.

BENZYL BENZOATE IN WHOOPING-COUGH.

MACHT, in the *Johns Hopkins Hospital Bulletin* for July, 1920, states that the number of cases studied was about 115. Of these a few were in adults, but the vast majority were in children ranging in ages from a few weeks to fourteen years. Many of these cases occurred in groups of two, three or more in one family; and owing to the prevalence of the epidemic and its severe form, the diagnosis of whooping-cough, in most cases, could very easily be made. All these cases were characterized by whooping, and in many the paroxysms were accompanied by vomiting and small hemorrhages. In a number of cases a blood examination was made and gave the characteristic blood picture of pertussis. Most of the patients before coming under his observation had been treated by parents or doctors with paregoric and other popular drugs without any benefit, while others had been left alone without any treatment whatever. A number of the patients received vaccine treatment, but the results in these cases were also not at all striking.

When a study of the cases was begun, all other medication was discontinued and the patients were given a 20-per-cent solution of benzyl benzoate by mouth. The dosage varied from 5 to 40 drops in water, three or four times a day and oftener, depending upon the age of the patient and the severity

of the disease. In cases in which the simple alcoholic solution of benzyl benzoate was found to be too distasteful to the young patients, it was flavored with a few drops of benzaldehyde and the medicine was administered in sugar-water or milk. He soon noted that the addition of a little benzaldehyde to a solution of benzyl benzoate in amounts varying from 1 to 5 per cent produced a mixture which seemed to act more effectively in cases of whooping-cough than benzyl benzoate alone. It was found that the administration of benzyl benzoate in the form of a suspension in simple elixir, in syrup of yerba santa and other syrups or elixirs, was not a satisfactory method either of disguising the taste or administering the drug over long periods of time, as such mixtures are too bulky and unsightly and in most cases tend to disturb digestion even more than a benzyl benzoate in alcohol would do in sensitive persons when administered without any flavoring.

The results of the clinical observations were as follows: About 90 per cent of all the patients showed more or less beneficial effects; about 50 per cent exhibited marked improvement in the symptoms. The therapeutic effects of benzyl benzoate were not of a curative character, but were of a distinctly palliative nature. These effects were manifested either by a reduction in the violence or in the number of paroxysms, or both; and also by the elimination of certain untoward sequelæ following violent whooping, such as vomiting, subconjunctival hemorrhages, lack of sleep, and emaciation. In many cases the relief afforded by the drug was so marked that the parents came begging for more of the drug and recommended it also to their friends. Many of the patients who responded favorably to benzyl benzoate had been previously treated unsuccessfully with bromides, antipyrin, quinine, belladonna, paregoric, and even heroin. In some cases he purposely interchanged or alternated the benzyl treatment with one or other of the above drugs, and the difference in the therapeutic effects could be readily noticed. Among such cases were three of his own children who were suffering with whooping-cough in a severe form. These patients were given all kinds of whooping-cough remedies, including heroin. None proved to be in the least effective unless given in toxic doses (heroin). On the other hand, when the children were given a solution of benzyl benzoate plus benzaldehyde, a most remarkable relief in the violence of the paroxysms as well as a decrease in their number was noted. Whether benzyl benzoate has any effect upon the duration of the disease is at present impossible to say. It is doubtful whether the drug will have any influence on the cause of the disease, but there is no doubt whatever, from his experience, that in benzyl benzoate we certainly have a valuable palliative preparation, and the value of such a drug, in view of the disastrous consequences of repeated and violent whooping paroxysms, needs no emphasis.

A very interesting question in connection with the effect of benzyl benzoate on whooping-cough is: How does it act? To that end Macht has been conducting a series of experiments during the past year, and these experiments seem to indicate that the benzyl effect in paroxysmal cough is exerted advantageously through a number of channels. The pathological physiology of whooping-cough is too complicated to be discussed in detail in the present paper; perhaps the best monograph on the subject is still that by G. Sticker in Nothnagel's "System," to which the reader is referred. Briefly it may be stated that the two conditions which are conceded by all pathologists and clinicians to be present in whooping-cough are: (1) A catarrhal condition of the larynx and other respiratory passages with a tenacious mucous secretion in the larynx; and (2) an excessive irritability or hypersensitiveness of the nervous mechanism of the larynx which readily induces a spasmodic contraction of the laryngeal muscles.

The pharmacological action of therapeutic doses of benzyl benzoate in whoop-

ing-cough is apparently a manifold one. In the first place, the antispasmodic effect of the drug on bronchial spasm, which very often accompanies the paroxysms, probably plays some rôle.

Secondly, he has conducted experiments in regard to the effect of benzyl benzoate on the contractions of striated muscle and found that the drug is also a sedative for skeletal muscle, though not in the same degree as in the case of smooth muscle.

In the third place, and this is probably of very great importance in the relief of the whooping paroxysms, evidence was found that benzyl benzoate probably exerts a slight anesthetic effect on the larynx. It was found that the anesthetic action so markedly exhibited by benzyl alcohol is also exhibited in a high degree by benzaldehyde, and to a lesser degree by benzyl benzoate; and that both benzaldehyde and benzyl benzoate, when taken by mouth or even injected intravenously, are in part excreted in the saliva and the bronchial secretions. They therefore probably tend to diminish the sensitiveness of the otherwise excessively irritable mucosa of the larynx, and in that way prevent the vicious reflex which starts the paroxysms.

Fourthly, he has found through experimental studies on animals, as well as from clinical observations on patients, that the benzyl esters act as expectorants; and they therefore probably help to liquefy the tenacious clumps of mucus characteristic of whooping-cough which are found in the larynx.

Fifthly, he has found from animal experiments and also from clinical observations that benzyl benzoate is more or less of a sedative to the respiratory center, and it would appear probable that this sedative effect upon the respiratory center is more marked in man than in the lower animals.

Lastly, it is very possible that the antiseptic properties of benzaldehyde and benzyl esters may play a rôle in combating the etiological factors of the disease.

It will be seen from the above considerations that the mode of action of benzyl benzoate in whooping-cough is somewhat complicated. The effect of the drug in this condition is probably not a specific one, and indeed the author has used benzyl benzoate with benzaldehyde successfully as a sedative in other forms of irritating spasmodic cough with viscid mucus.

As a result of a careful study of the cases treated, he is inclined to believe that benzyl benzoate, either alone or, still better, combined with a little benzaldehyde, is a valuable palliative or symptomatic remedy in pertussis. It is, of course, well known that in practical therapeutics no measure will give 100 per cent of successful results, so that a trial of the above treatment by other observers is very desirable. Macht especially emphasizes the very low toxicity of benzyl benzoate, which would warrant its administration in even larger doses than those at first recommended. The dose of the drug to be employed will have to be determined by the physician in charge of each case. Thus, in a small series of about 30 cases of whooping-cough treated at his suggestion by officers of the health department of another city, the results obtained were much less promising than in his own cases, but later experience has convinced him that much better results would have been obtained had the dosage been somewhat larger than that recommended originally in this series of cases. On the other hand, reports from other sources seem to sustain his original favorable experiences. More complete data of the experimental work in connection with this investigation and also further clinical experiences will appear in the *Journal of Pharmacology and Experimental Therapeutics*.

He concludes:

1. The administration of benzyl benzoate solution alone, and still better, in combination with small doses of benzaldehyde, exerts a beneficial palliative effect on the violence and number of whooping-cough paroxysms.

2. The mode of action of the drug in such cases has been investigated experimentally and is discussed in the text.

3. In view of the low toxicity of benzyl benzoate and benzaldehyde, and the considerable number of successful therapeutic results obtained with them, their further trial in the symptomatic treatment of paroxysmal cough, and especially of whooping-cough, is deemed advisable.

RADIUM IN GYNECOLOGY.

TALIAFERRO, in the *Virginia Medical Monthly* for July, 1920, states that all cases of cancer of the cervix or uterus, when seen in the early stages, should be treated surgically. A panhysterectomy should be done; after which 50 mg. of radium, well screened, should be applied to the vault of the vagina for twenty-four hours. In these cases he usually places the radium in an Irish potato and puts this inside of a thin rubber bag. By this means he can get as near the vault as he wishes, and at the same time protect the bladder and rectum. This should be repeated as often as the judgment of the operator requires.

If the patient is not seen until the cancer has developed sufficiently to open up the question whether it be operable or non-operable, it should be decided that it is inoperable, and should be treated with radium. When once treated with radium, the uterus should not be removed. The woman should receive 1200 mg. hours of radium, which should be repeated in from fifteen to thirty days.

The uterus should not be removed, because radium produces a sclerosis of the lymphatic vessels which always checks metastases. There has been a great deal written in reference to the dosage of radium. Some writers advocate as much as two hundred mg. of radium inserted in the uterus for from twelve to twenty-four hours. This amount seems to him to be too large. He very rarely uses over fifty and occasionally seventy-five, as he gets better results and there is less chance of destroying the underlying tissues. These large doses of radium always produce amenorrhea, and therefore it is his custom to give these patients large doses of ovarian extract or corpus luteum, as it prevents the nervous symptoms produced by an artificial menopause.

Radium has a wonderful effect on the large cauliflower cervical cancers — they seem to melt away like magic; all the foul discharge usually disappears in about three weeks, and while it does not cure them it gives these unfortunate individuals a period free from pain and discomfort, and they are able to be about attending their duties.

Radium is extremely useful in essential menorrhagia: that is, menorrhagia without any demonstrable pathology. Young women who present themselves for treatment for this condition, if other remedies have failed to check the flow, should be given small doses of radium treatment. They should receive about twenty-five or fifty mg. of radium, depending upon the case. This should be inserted into the uterus so that they should receive about two to three hundred mg. hours. This treatment may be repeated if necessary. With this small dose of radium there is little possibility of producing sterility, as this small dose affects more particularly the mucous membrane of the uterus, and has very little, if any, effect upon the function of the ovary. Patients treated in this manner do not cease menstruating, but the menstrual flow is diminished, and they usually become regular and normal in most instances.

In older patients in whom it is desirable to stop the menstrual flow completely, larger doses should be administered. Fifty mg. inserted in the uterus for from twelve to twenty-four hours, as a rule, completely stop menstruation. Through the period following the use of radium the flow is generally as profuse, or even more so, than before. This is perhaps due to a hyperemia of the endometrium. These patients usually pick up and take on weight, the anemia disappears, and the patients gain strength very rapidly.

Small fibroids and myomata respond very quickly to the use of radium in many

cases, but these cases should be handled surgically rather than with radium during the child-bearing age. The reason for this is obvious, for a myomectomy may be done for the removal of the tumor without interfering with subsequent pregnancy. If a sufficient quantity of radium is used sterility will be the result.

Radium may be used in the treatment of large fibroids in that type of women who are anemic, run down from the loss of blood, and are poor surgical risks. It will stop the flow and allow them to build up, so that the tumor may be removed later. In that class of patients in which surgery is contraindicated due to debility and cardiorenal disease, radium is the treatment of choice.

In concluding, he emphasizes the following points: That early cancer of the cervix or uterus should be first treated surgically, doing a complete hysterectomy, to be followed by the use of radium. Those cases in which the cancer has developed, and there is a question whether to operate or not, should be considered non-operable and treated by radium. In cases far advanced we have no therapeutic agent equal to radium. When cancer of the cervix has been once treated with radium, no surgical operation should be performed.

Stacy says that radium is the treatment of choice in:

1st. Cases of menorrhagia, or menopause not associated with large fibroid tumors, and in which the possibility of carcinoma is definitely eliminated.

2d. Cases of menorrhagia in patients between the ages of thirty-five and forty-five years, who have small submucous fibroid tumors or who have no demonstrable lesions.

3d. Cases of myomas in which there is a definite contraindication to operate.

4th. Cases of menorrhagia in the young person who has resisted all medical treatment, in which very small doses should be given.

He further emphasizes that care be taken in the diagnosis of all uterine hemorrhages; uterine scrapings should be examined of all women having menorrhagia not due to a known definite lesion. All women upon whom we produce an artificial menopause should receive 10 grs. of ovarian extract or 5 grs. of corpus luteum three times a day, so as to prevent nervous symptoms incident to menopause.

THE RELATION OF FOCI OF INFECTION TO THE GRAVE ANEMIAS.

RINKER, in the *Virginia Medical Monthly* for July, 1920, states that in a series of cases which he studied the symptoms were as follows:

A gradual onset of weakness and fatigue, increasing pallor, loss of weight, marked nervous irritability, dyspnea, gastrointestinal disturbances of varying degree, insomnia, and at times edema of the extremities. Some cases exhibited an afternoon rise in temperature. Several of the series complained of numbness in the feet and legs and exhibited an ataxia, indicating spinal cord anemia as described by Bassoe, Billings, and others. Paresthesia and sometimes anesthesia may be included in the symptomatology.

The blood pictures presented a high degree of oligocythemia with relatively high color index, poikilocytosis, anisocytosis, and, in some of the cases, nucleated red cells. The leucocytes were at times slightly increased, but usually there was a leucopenia.

In the entire series of 20 cases some focus of infection was located. Twelve of these cases were cured and six were much improved following the removal of infections and general treatment. Two cases died while under treatment.

He adds that it is scarcely necessary for him to emphasize the necessity of painstaking regimen in the diagnosis and treatment of the anemias. Hunter has called attention to the importance of not being content with a single measure in the care of these cases, and insisted upon "the general management of the case with close

observation of all its features, especially of its fever and its hemolytic symptoms, extending not only over the period of acute illness, but also over many months and years subsequent to the first remission." Thus, when the symptoms and blood picture of a patient indicate a severe type of anemia with a relatively high color index and abnormal red cells, it is our duty to begin a thorough search for some underlying cause. Hemorrhage, intestinal parasites, syphilis, neoplasm, chemical poisoning, etc., being eliminated, we then turn to the question of focalized infections. In this study the open avenues of infection should be given first consideration for the localization of possible infectious processes in the teeth, tonsils, nose and accessory sinuses, remembering that infection may exist in the nose and sinuses without suppuration; and, secondly, our attention should be diverted to the ear, gall-bladder, appendix, heart, joints, and genito-urinary tract for some possible secondary focus of infection.

An infectious process or processes having been located, the following routine treatment is suggested:

1. The patient should be put to bed at absolute rest.

2. The diet is of great importance, such foods being given as will produce the greatest amount of nourishment. Feeding should be given frequently, every three or four hours, and in small quantities.

3. Mild sedatives may be used to encourage sleep, if necessary.

4. Iron and arsenic are indicated especially in these cases in order to stimulate the blood-making organs. These drugs are utilized to best advantage when given hypodermically; he prefers the ampoule preparations made by the various drug houses. One ampoule of iron and arsenic may be given intramuscularly twice a day, or sodium cacodylate gr. 1 or 2 may be used once a day. The kidneys should be watched carefully during the administration of these drugs.

5. These patients may be prepared for surgical intervention as soon as possible. Some of the anemia patients have a tendency to hemorrhage, particularly those showing some evidence of purpura hemorrhagica. The coagulation time, if taken, will be a guide in these cases, and, if found to be increased, he has used horse serum to the exclusion of other materials which tend to shorten the clotting time, with excellent results in preparation of the patient for operation.

The cases bear the operations necessary for the removal of the primary foci of infection very well. Surgical procedures should be done under local or gas-oxygen anesthesia if possible. The removal of primary foci is usually followed by rather rapid improvement in the blood picture and general condition of the patient. If a secondary focus exists in gall-bladder, appendix, prostate, etc., it can be removed after the patient has been gotten into better shape. Barker reports a case with 38 per cent hemoglobin and 1,400,000 red cells from whom several infected teeth were removed. The operation was followed by rapid improvement in the patient's condition, and after the hemoglobin had reached 80 per cent the patient's prostate was successfully removed. One of Rinker's cases having hemoglobin of 25 per cent and red cells of 1,020,000 was treated routinely until the hemoglobin reached 55 per cent and red cells 2,600,000, when the tonsils were removed. Later, after the hemoglobin had reached 80 per cent and red cells 4,200,000, her gall-bladder was successfully removed.

Blood transfusion is of value in preparing these cases for early operation, but it is not recommended as a curative measure.

Following operative procedure, it is important to continue the general hygienic care, rest, diet, and iron and arsenic treatment, until there has been a definite improvement in the blood picture. The patients being allowed up may gradually resume the activities of life as the general condition and blood picture approach normal.

THE INFLUENCE OF IODINE ON HYPERTROPHY OF THE THYROID GLAND.

Loeb, in the *Journal of Medical Research* for May, 1920, in summarizing his article on this subject states that the administration of iodine does not diminish the intensity of hypertrophic changes in the thyroid gland of the guinea-pig which follow extirpation of such a quantity of the gland as is necessary to call forth compensatory hypertrophy. There is, on the contrary, an indication that possibly iodine preparations increase such hypertrophic changes. This, however, cannot be stated definitely at the present time, and must be left for further investigation.

The effect of iodine on compensatory hypertrophy differs, therefore, markedly from that on endemic goitre, and we must conclude that both are essentially different conditions. We likewise must conclude that the conditions influencing compensatory hypertrophy of the thyroid gland differ markedly from those determining metamorphosis of amphibian larvæ, and that the latter is not so much an indicator of thyroid activity as of the action of iodine as such.

In those experiments in which great parts of the thyroid were extirpated, during the summer months, compensatory hypertrophy resulted in a much lower percentage of cases than in experiments carried out in the colder season. This suggests a relation between compensatory hypertrophy and temperature. Further experiments must decide whether this relationship is real or merely coincident.

BACILLARY DYSENTERY IN CHILDREN.

Davison, in the *Johns Hopkins Hospital Bulletin* for July, 1920, asserts that children should be breast-fed or given only boiled milk in boiled containers. Children and milk should be protected from flies, and when cases occur the stools should be completely covered so that flies do not have access. Almost invariably mothers will save specimens, for the visit of the doctor, either wrapped in a newspaper or in an imperfectly covered receptacle. Those engaged in caring for a patient with dysentery should not prepare food for other children. These recommendations seem self-evident, but they are necessary and are difficult to enforce rigidly.

Whether inoculations with dysentery vaccines will prove of value in children is problematical. Heretofore the severe reactions to these vaccines have prevented their use except in the face of a grave epidemic, but the recent work of Graeme Gibson in the British army would seem to indicate that the reactions may be eliminated without impairing the value of the protection. Wholesale inoculations will probably never be necessary, but eventually it may prove of value in cities that have a high incidence of infantile dysentery.

At present the treatment of this condition, as of typhoid fever, is merely palliative and does not seriously affect the mortality, yet the stamping out of this disease by suitable quarantine by health departments is an attractive possibility. This can only occur by recognizing that ileocolitis is caused by dysentery bacilli and reporting it as dysentery. Just as the clinical name of enteric fever was changed to typhoid and paratyphoid fever, so ileocolitis and infectious diarrhea should be renamed in accordance with their etiology as dysentery in children. This plea was made in 1903 by Knox, following Duval and Bassett's pioneer work, but the old names still persist. One great advantage to be obtained from such a change in nomenclature would be the making of the disease reportable. In many of our cities dysentery is a reportable disease, but ileocolitis attracts no official notice. Inasmuch as in his series of cases bloody stools and a febrile onset are practically pathognomonic of dysentery, it would seem that the majority of cases can be recognized on clinical grounds and reported to the health authorities.

Davison concludes:

1. Over 80 per cent of the acute cases of ileocolitis both in Baltimore and Birmingham were due to infection with *B. dysenteriæ*.

2. *B. dysenteriæ* (Flexner) is more prevalent than *B. dysenteriæ* (Shiga) in Baltimore, Maryland, and Birmingham, Alabama.

3. Clinically as well as bacteriologically the Baltimore and Birmingham cases were identical.

4. *B. dysenteriæ* (either Flexner or Shiga) was not found in the stools of 63 cases of simple diarrhea, nor in those of 100 normal children.

5. The name ileocolitis should be changed to dysentery in children and the disease made reportable to the health authorities.

6. Dysentery (ileocolitis) is probably spread from the stools of one patient to the food and mouths of other children by flies and infected hands and not disseminated from a general dairy source.

7. Dysentery is less prevalent among children receiving breast milk or boiled milk and boiled milk mixtures in boiled containers.

8. The agglutination reactions of the patient's serum by standardized technique is of assistance in the diagnosis of dysentery.

9. *B. Morgan* No. 1, *B. Welchii*, *B. pyocyaneus*, *B. proteus*, and the *Streptococcus fecalis* are not the cause of dysentery (ileocolitis) or diarrhea.

HAY-FEVER AND PAROXYSMAL RHINORRHEA.

AGAR, in the *British Medical Journal* of July 24, 1920, states that during the past four years his attention has been concentrated on the treatment of hay-fever, paroxysmal rhinorrhea, and allied conditions. The results which are being obtained at the present time lead him to believe that great relief can be given to the majority of patients.

The method employed, which so far as he is aware has not been used previously, consists essentially in treating the vestibule of the nose. The vestibule—that is to say, the in-turned skin of the nostrils—is carefully examined for any fissures or sore spots and a note made of their whereabouts; it is then rubbed with an astringent lotion, silver nitrate gr. xxx to the ounce being the solution he generally uses. The rubbing is carried out thoroughly and systematically. Particular attention is paid to two spots: the first is high up on the outer wall and the second is the floor about half to three-quarters of an inch back from the orifice. No part of the vestibule must be missed, and the nostrils must be stretched to open up the folds. He makes no application to the mucous membrane, and does not touch it if he can help it, but it is possible that some of the solution goes in further than he intends.

The results up to the present show that all cases of nasal rhinorrhea treated by this method have been cured; that condition appears the easiest to treat.

Good results are obtained also with patients suffering from hay-fever. This year seven patients were treated about a month before the symptoms were due and have practically escaped. It is true there have been occasional slight "reminders," which, however, merely serve to show that they have not outgrown the complaint. All seven regard themselves as cured.

Some cases of asthma have also been treated, but the results have been less satisfactory, although some improvement has been obtained. In all cases of paroxysmal sneezing and asthma the external auditory meati should be inspected for impacted cerumen, dermatitis, etc. In what may be called extreme cases of hay-fever he does not use the silver nitrate at first, but applies an anesthetic solution to the vestibule and a wide area around.

℞ Acidi carbolici, m iij;
Olei menth. pip., m vj;
Sp. vini rect., f℥ iv.
Misce. Fiat pigmentum.

After a few minutes lotio calaminæ

should be applied to an even wider area of the face. He draws special attention to the manner in which the application of this anesthetic solution to the nasal vestibule relieves the eye sensations in hay-fever and clears up the occasional blurring of vision of which many people complain, although they are not subject to hay-fever. He believes that the efficacy of the treatment depends upon diminishing the abnormal sensitiveness of the skin.

If a normal person paints the vestibule with the silver nitrate solution he will not experience the slightest irritation nor will any reaction follow. If, on the other hand, the person is subject to one of the diseases mentioned above a reaction of varying intensity will follow. His eyes will water, he will sneeze a few or many times, and both nostrils will run copiously, a milky fluid coming away, and in some cases a cough and temporary feeling of tightness of the chest will occur. The reaction lasts from half an hour to twelve hours.

This convinces him that our aim in treatment must be to lessen the hyperesthesia of the skin of the vestibule.

TREATMENT OF OBSTINATE OCCIPITOPOSTERIOR POSITIONS.

DeLee, in the *Journal of the American Medical Association* of July 17, 1920, states that one finds two classes of cases: first, those in which the head is engaged, and second, when the head is in or above the inlet. Occasionally one is met in which the head is arrested in the second parallel plane of Hodge, but it is treated as if the head were not engaged.

When the head is high, floating, interference is not necessary; but a careful search should be made for any condition that may demand treatment for its own sake. Watchful expectancy is the course to pursue. Rupture of the membranes should be prevented, if possible, because labor is more often retarded than hastened by it. The woman should lie on the side to which the occiput points; this is supposed to favor flexion, engagement, and rotation. Morphine and scopolamine are used in the first stage to prevent exhaustion of the mother and child, but it is not wise to let the labor drag on too much. By means of a colpeurynter the dilatation of the cervix may be completed and the case thus prepared for interference if required. After complete dilatation of the cervix, he usually waits an hour or two to see whether or not the head will engage. If it does not, the membranes are punctured—the patient being on her side, to prevent prolapse of the cord. If the head does not engage very soon, two courses of procedure are open: version, followed by extraction if need be, and manual correction of the position. In multiparas there is little choice, and individual preference may be exercised.

Under deep anesthesia the whole hand is passed into the uterus, pushing the head up and out of the pelvis if necessary. That hand is selected which will have its palm directed toward the face of the infant. The posterior shoulder of the child is sought and with the tips of the fingers is swung around to the front, past the promontory of the sacrum. The head, fitting into the palm of the hand, goes with the trunk. When the inside hand is leading the occiput into the pelvis in its new position, the outside hand forces the head down by pressure on the occiput, which is now to be felt over the pubic ramus. It may be advisable to draw the head down deep into the pelvis with forceps, await from four to six labor pains, remove the forceps, and leave the case to nature, or to follow a later indication. The latter plan is especially successful in primiparas, because the molding of the head and the softening of the tissues produced by a few hours labor and the progress of the head toward the outlet immensely facilitate the subsequent delivery. In rare instances the manipulation fails because the child is held immovably in the anomalous position, or because the cord prolapses; or the placenta may be in the lower uterine segment and become compromised, or perhaps one discovers

even at this late time, a contracted pelvis, an overgrown child, an overrigid cervicovaginal canal. Unless the asepsis of the case has been botched, it is not too late to perform a suprasymphyseal cervical Cæsarian section. These are rare cases; usually it is possible to rotate the child, and bring the head into the pelvis. A warning must be urged against the use of forceps in these high head cases. If descent rotation and extraction are forcibly effected by forceps, the child is always injured, often killed, and the mother likewise maltreated. This is one of the commonest causes of stillbirth and puerperal infection.

After the head is engaged, the case is gratifyingly simplified. If the cervix is fully dilated and the pains good, a little pressure upward on the forehead during a pain may aid flexion and favor rotation (Hodge's maneuver). Two fingers placed alongside the forehead on the anterior lateral inclined plane of Hodge may direct the forehead backward, or one may try to draw the occiput forward with three fingers, as Tarnier suggested. If these simple procedures and the consequential lying on the side of the occiput do not show results, or if rectal examination shows that the occiput has rotated to the sacrum, the patient should be etherized, and the head rotated to the proper position by combined internal and external manipulation. Contrary to what is usually taught, this is not as a rule difficult; the trouble has been to hold the head in its new position long enough to apply the forceps. As soon as the fingers are off the head, it rotates back again to where it was. We can prevent this by the simplest of means: After rotation has been accomplished the scalp is grasped firmly with a double vulsellum or 8-inch artery clamp, and an assistant holds the head in proper position until the forceps can be applied. He has performed this operation so often and always successfully that he heartily recommends it for general practice. With care, of course, and gentleness, it does no harm. The little wounds are touched with tincture of iodine after delivery. Even when the head is not engaged he has succeeded in rotating and holding it in position with the vulsellum; but it is best to first effect the rotation by hand, and then apply the vulsellum. In face presentation the occiput may be pulled down with vulsella for a typical application of the forceps.

Since adopting this simple and harmless method he has discarded Scanzoni's maneuver, and he has not found it needful to deliver a case with the occiput posterior.

ANESTHETIC NOTES.

In the *Indianapolis Medical Journal* for July, 1920, GUEDEL states that the posterior pharyngeal reflex is the little devil that worries the anesthetist and operator in tonsillectomy. The importance of this with gas-oxygen is not sufficiently recognized.

There are patients requiring tonsillectomy in whom ether is directly contraindicated. These should be operated upon under nitrous oxide-oxygen, but the difficulty of this procedure in the minds of both anesthetist and operator often stands in the way. This difficulty is real but exaggerated. It is lessened by an understanding of the technique required, and definite team-work between the operator and anesthetist.

There are certain rules to be followed in rendering this operation under nitrous oxide easier and more practical.

First, as stated above, the posterior pharyngeal reflex is the little devil most annoying. This reflex is but little if at all obtunded under gas-oxygen. Therefore it is imperative that the operator and his assistants stay off of this surface as much as possible. To press forcibly with or to drag a sponge or aspirator tip across this surface under gas-oxygen anesthesia usually brings on retching or vomiting, with spasm of all throat muscles, which is the main difficulty in this procedure.

It is to be remembered that the aspiration into the lungs by the patient of blood and mucus is, under gas-oxygen, much less

likely than under ether, because under gas-oxygen the laryngeal reflex is practically as active as in the conscious state.

The tonsils and fossæ may be sponged, aspirated or clamped usually without disturbance, but, "Stay off the posterior pharyngeal wall."

Second, the prevalent "necessity of speed" idea on the part of both operator and anesthetist is wrong. With proper team-work the patient may be carried on indefinitely, and any type of dissection—snare operation or Cluder—be carefully carried out, with a patient on whom any other operation is practical under nitrous oxide. The immediate result is usually better where careful rather than attempted speed technique is employed.

Third, hemorrhage is less with nitrous oxide where enough oxygen to keep the patient pink is administered, and if after the operation is completed the pharynx be flooded with pure oxygen, the blood coagulation time is markedly shortened.

Fourth, team-work is here absolutely necessary. The operator and anesthetist must understand each other thoroughly.

TREATMENT OF DIABETES COMPLICATED BY PULMONARY TUBERCULOSIS.

In the *Journal of the American Medical Association* of July 17, 1920, JANNEY and NEWELL summarize their article on this subject as follows:

1. Data presented indicate that the untreated diabetic is more likely to develop pulmonary tuberculosis than when maintained sugar-free by modern dietetic methods.

2. In a series of sixteen diabetic cases complicated by pulmonary tuberculosis showing activity, twelve patients definitely improved during a course of institutional treatment; diabetic symptoms disappeared in all but two cases, observed but a short interval. Tuberculous symptoms improved in the majority of cases.

3. The principles of treatment recommended are the judicious employment of sufficient undernutrition, combined with rest, to maintain the patient sugar-free and control the tuberculosis. Fasting is unnecessary to obtain good results. Ill-advised fasting may lead to a fatal outcome. Rest is at least as important as in the treatment of uncomplicated pulmonary tuberculosis.

ABORTION: ITS CAUSE AND TREATMENT.

MONCURE, in the *Virginia Medical Monthly* for July, 1920, states that the treatment of abortion lies, first, in the cause. Remove the cause and you will have no abortions to treat. In threatened abortions put the woman to bed, and keep her absolutely quiet; opium suppositories, or other form of opium by rectum, he believes are better than opiates by mouth. Bromide and chloral by mouth, however, have been very beneficial in threatened abortion in his hands. In inevitable abortion, the only thing to do is to empty the uterus of its contents; but let nature do so if she will, assist her to do it if she will not. If there is any infection, or continued hemorrhage, curette thoroughly with a dull curette, unless the retained matter can be easily pulled out with a pair of curved ring forceps, or even with the hand. The after-treatment is the same as that following delivery. The patient should be kept in bed for at least a week, or even ten days; but he finds it difficult to keep patients in bed so long.

NON-INTERFERENCE IN THE TREATMENT OF PUERPERAL AND POST-ABORTAL INFECTIONS.

In the *Journal of the American Medical Association* of July 17, 1920, KING states that if retained placental tissue is presenting through the partially dilated cervix, it is gently removed with the finger or with the ovum forceps; no other local manipulation, in or out of the uterus, is performed. The patient is put to bed, the head of the bed being elevated if the infection is of

recent origin and appears rather virulent. The object of this is to facilitate drainage and, if possible, to limit the infection to the pelvis. He is not sure that this posture helps to attain these results, but is under the impression that the patients are benefited by a few days of the Fowler position at the beginning of the treatment.

Hyperpyrexia is controlled by hydrotherapy; mild fever requires no treatment. Fluids (chiefly water) are supplied plentifully—by mouth, if tolerated; by rectum, when indicated, and at times by hypodermoclysis or intravenous saline infusion. In a few cases he has transfused, but has not as yet been able to see that he has thereby improved his results. The patients are nourished freely on soft or semisolid food, the only contraindications being vomiting and peritonitis. The bowels are kept open by enemas, saline laxatives being used only occasionally; in the infrequent cases of nausea without peritoneal involvement, small doses of calomel are sometimes given. In cases of pelvic cellulitis or pelvic peritonitis, he applies an ice-bag to the hypogastrium; when the actual local symptoms have subsided in these cases, he begins the employment of copious douches of plain hot water twice daily. It may be weeks before the patient is considered ready for this part of the treatment.

Drugs are secondary to the general supportive measures. King has found the various tonics and stimulants, including alcoholics, to be of no assistance; often they are detrimental in that they are prone to disturb the patient's digestion. Sleep is induced, when necessary, by bromides or barbital. Opiates are studiously avoided, being used only when other measures fail to relieve pain or to procure the needed sleep. The usual laboratory studies are made, and he is especially careful to examine the blood for malaria, and the stools in suspicious cases for ova of uncinaria, two fairly common infections in out-of-town patients. A blood culture is taken every day for four days, as he often finds it necessary to take three or four cultures before a positive culture is obtained. In cases of streptococcic bacteremia he has tried the serum treatment, but with negative results. As soon as the patient begins to improve and can be moved, she is carried to the sun porch daily for a few hours of fresh-air treatment.

In brief, the patient is given a general supportive treatment, and the pelvis is left severely alone after the preliminary examination. We know that in practically all cases there is an endometritis, but he is sure that local treatment of the endometrium does more harm than good. In cases of septic abortion, with retention of placental tissue, one is sometimes forced to sponge the uterus out carefully on account of hemorrhage; even this gentle procedure often causes a rise of temperature. In the cellulitis cases, he makes vaginal examinations occasionally if the abnormal temperature persists, in order to discover accessible pus-foci, if any develop. In blood-stream infections, without local pelvic exudate, as a rule he makes no further local examination until the patient is ready for discharge.

The treatment of septic abortion with retention of placental fragments is by no means settled as yet, the measures advocated by various authorities ranging all the way from curettage to absolute local noninterference. Experience with the various methods has taught us that the best results are obtained in these cases by letting the uterus alone until the temperature is normal and the uterine culture becomes negative. The only exceptions are (1) patients in whom placental tissue appears through the open cervix, or (2) patients suffering from profuse bleeding due to the retained fragments. However, in several cases in which there are general symptoms of moderate severity and very foul discharge, he has seen the condition improve rapidly and the fever disappear quickly after removal of the retained tissue with the ovum forceps or the finger; on the other hand, other patients have developed very severe bacteremias after the same procedure. Of course, the difference is due to

the variations in the bacterial flora of the uteri of the different patients, so that the safer method is to follow the advice of Polak and await the report on the culture before deciding on the treatment to be followed. Many of these cases will complete themselves; in the others, small doses of pituitary extract may be given, and they can be completed when the bacteriological report indicates that it is safe to do so. He agrees with Polak that many of these patients will need a curettage later, on account of the menorrhagia due to endometrial changes consequent on this retention.

THE POSTOPERATIVE CARE OF THE FEMALE BLADDER.

HARGRAVE, in the *Virginia Medical Monthly* for July, 1920, states that a few years ago Watkins, of Chicago, called attention to the rôle of distention of the bladder as a cause of postoperative cystitis, and made a plea for more frequent catheterization after operation. Howard Kelly warned against the distended bladder more than twenty-five years ago. Yet, many surgeons say, "Do not catheterize unless absolutely necessary," and not before ten or twelve hours. It is known that the bladder is able to take care of infectious organisms, when its resistance is unimpaired; but distention, trauma incident to operation, improper catheterization, lower the resistance to such an extent that infection takes place. Many cases that are allowed to go ten or twelve hours develop distention with overflow and, when the patients are finally catheterized by the usual method, infection may result. The proper interval to catheterize depends upon the nature of the operation. In the ordinary abdominal case when the bladder has not been traumatized, an eight-hour interval is advised, provided the patient does not complain of distention before that time. Patients are good judges as to when their bladders are full. If the operation was one involving trauma of the bladder, the interval should be no longer than six hours. In all plastic cases involving the anterior vaginal wall or bladder, four hours is the proper interval.

Prepare the field as for operation, using sterile drapery. Connect a sterile, well-lubricated glass catheter with an irrigator containing boric acid solution. Introduce catheter into the urethra half an inch, with the fluid flowing, and thoroughly wash out urethra. Disconnect the catheter and gently push in bladder and drain. Introduce through the catheter one ounce of any of the following germicides, and have the patient retain for at least one hour, or until the next catheterization, unless they void spontaneously—argyrol 10 per cent, protargol 1 per cent, mercurochrome 1 per cent.

For a number of years Hargrave has insisted on leaving argyrol in the bladder after each catheterization, and, when this has been done, he has not had a single case of cystitis develop. Argyrol 10 per cent is a good bactericide, non-irritating, and usually always available in any hospital. Young found no growth after five, fifteen, and sixty minutes, when sterile urine was inoculated with 3 mm. loop of 24-hour broth culture of the bacillus coli and staphylococcus aureus, and treated with 10-per-cent argyrol. With protargol in 1-per-cent solution, they obtained a growth with S. aureus after five, fifteen and sixty minutes, but no growth with B. coli. The objection to the silver colloids is that they have no penetrating powers. But as they are used to prevent infection, clinically he believes they are efficient. Mercurochrome 220 is considered the best antiseptic the authors have used. In 1-per-cent solution it kills the B. coli and S. aureus in one minute. It possesses remarkable penetrating power and is equal in this respect to acriflavine, a dye also used first in the genito-urinary tract in Young's clinic.

Hargrave has used both of these dyes in the treatment of cystitis, with the result that urine full of pus and bacteria will rapidly clean up and become sterile. He has not used any flavine since he has been

able to procure the mercurochrome 220, for Young seems to prove that flavines are antiseptics rather than germicides, when mixed with urine.

SURGICAL TREATMENT OF HYPERTHYROIDISM.

BEILBY, in the *New York State Journal of Medicine* for July, 1920, in his conclusions lays emphasis on the following points:

1. The removal of one lobe of the thyroid gland in exophthalmic goitre may give temporary relief but will not effect a cure.

2. If only a portion of one lobe is left and its blood supply is undisturbed, its hypertrophy and a recurrence of symptoms may be expected.

3. With careful preparation and selection of time a complete operation may safely be done in most cases at one time.

4. Where sufficient gland tissue is removed the toxic symptoms promptly and completely disappear.

5. This relief is a permanent one if the gland tissue which remains is not left in a condition such that hypertrophy may take place.

6. That experience in a sufficient number of cases justifies the belief that with the removal of the amount of gland tissue referred to, no symptoms of thyroid or parathyroid deficiency need be expected.

THE FAT-SOLUBLE VITAMINE.

MENDEL, in the *New York State Journal of Medicine* for July, 1920, states with respect to the rôle of the various vitamines in nutrition, the numerous investigations recorded in recent years already furnish certain information of practical value. Admitting the individuality of at least three types of vitamines already referred to in this paper, it appears that the antiscorbutic potency of many foods is more susceptible of deterioration by heat and perhaps other artificial conservation processes than are the other vitamines. It has been demonstrated conclusively, for example, that heat applied in the desiccation or sterilization of food—even the temperature at which milk is pasteurized—may destroy the antiscorbutic vitamine. Unfortunately this fact, well-substantiated in the case of certain food products, has been subjected in the popular literature on vitamines to broad generalization with respect to all types of foods. It is known, however, that tomatoes and orange juice, for example, are far more thermostable than some of the current statements would lead the untrained reader to assume. In fact, precisely what factor is responsible for the diminution of antiscorbutic power in the heating or drying of foods remains to be elucidated. It is not unlikely that other factors than heat—for example, oxidative changes—are the determining incidents in the loss of this vitamine. In contrast with the antiscorbutic vitamine, both the fat-soluble and the nutrition-promoting water-soluble vitamines show greater stability toward heat and desiccation.

The wide distribution of water-soluble vitamine in diverse structures of many types of plant and animal tissues which serve as foods for man and the domestic animals seems to render the possibility of a deficiency in this category of vitamine less likely than is the case with the fat-soluble vitamine. Accordingly, from the practical standpoint, there is perhaps greater likelihood of pathological results arising from shortage of the fat-soluble vitamine than of the others in every-day life. The demonstration of its wide-spread occurrence in some of the plants appears to be a fortunate circumstance in view of the fact that the hitherto best-known abundant sources of fat-soluble vitamine—milk fat and egg fat—are frequently not readily available to large classes of population. Recent investigations by Hindhede have suggested that the success of the Danish people in nourishing themselves during the later periods of the world war on diets exceedingly poor in fat, or furnishing at best lard and other fat products

deficient in fat-soluble vitamine, was due in some measure to the abundant intake of plant foods supplying the missing factor. It may be, furthermore, that the quantitative need of this in the case of adults has been somewhat exaggerated, because our impressions of its importance have been gained so largely through the study of the greater demand for fat-soluble vitamine by growing individuals. Further bearings of this must be left to his colleagues in the symposium for discussion.

It needs to be clearly emphasized to most persons that the so-called vitamines have not yet been isolated; nor has much light been thrown upon their chemical nature. Up to the present time at best little more than the solubilities and possible methods of partial concentration have been reported. In view of this fact physicians and others interested in practical dietetics should beware of false or exaggerated statements regarding the superior potency of proprietary preparations or nostrums which may lay claims to unusual merit as sources of vitamine. At the present time it still seems most rational to depend upon the demonstrated sources of the vitamines as they occur in our natural food products.

THE TREATMENT OF RINGWORM.

HUGHES, in the *British Medical Journal* of July 31, 1920, gives the details for the treatment of ringworm as follows:

1. The hair over and for a short distance round each patch is well shaved and afterwards thoroughly washed with soap and water, and finally with ether, to remove as much grease as possible.

2. The area is then painted with tincture of iodine.

3. When thoroughly dry the painted area is sprayed with ethyl chloride.

The active agent is, of course, the small amount of ethyl iodide formed.

The treatment is repeated twice a week. The average duration of treatment does not exceed a month for scalp cases, while in body cases it is even shorter.

ARTIFICIAL PNEUMOTHORAX.

HARRELL, in the *Virginia Medical Monthly* for July, 1920, states that the indications for artificial pneumothorax are, first, to control hemorrhage; second, advanced unilateral cases that are not responding to other treatment; third, advanced cases with one fairly good lung that is not responding to treatment may be given a trial. In case the good lung begins to do badly, the gas can be withdrawn. He emphasizes the point "not responding to treatment," as he believes that other measures should be given a trial first, and gas treatment, if started, should be continued from eighteen months to two years in order to obtain the best results—some say three years. Fourth, abscess of lung; compression should be tried before surgical intervention, as it is less dangerous, and one gets rid of the dirty dressings and foul discharge. Fifth, bronchiectasis; sixth, it was also used during the war by European surgeons to control hemorrhage after wounds of the lung.

Contraindications.—First, the patient should be easily accessible to a physician who is familiar with the work. The first few injections should be given either in a hospital or sanatorium where the patient can be watched closely and get injections as often as necessary. Second, advanced bilateral cases. Some operators out west have reported good results in a few bilateral cases by keeping one lung compressed for a while, and then compressing the other, but as a rule, if there is much involvement in a lung, it will not stand up doing the work of two. Third, "Fools." One should not attempt artificial pneumothorax on persons who think they know more about their disease than you. Before attempting to give gas one should fluoroscope the chest and get stereoscopic plates if possible so as to get a line on adhesions and pick out the clearest place to make the injection. During the treatment one should check up his work from time to time with the fluoroscope, for the physical findings are very deceiving.

With the first injection, especially with nervous people, it is best to give a hypodermic of morphine about half an hour before operation, to prevent pleural shock. The patient is put on the side, with the lung to be compressed on top, and a small pillow under the opposite side, with the head down, so as to separate the ribs as much as possible. Anesthetize a small area of skin, fascia, and pleura, using one-half-of-1-per-cent novocaine. Air is collected in a large bottle, passed through warm bichloride solution into another bottle which is elevated on its stand just above the level of the patient's chest. A "Y"-shaped tube, with the needle on the long end; one end is connected to the manometer, the other with the bottle containing the gas. In the manometer one has a colored liquid, usually water colored with ink. Some use mercury; his experience with mercury is that it is too heavy and does not oscillate well. After the skin is anesthetized, one makes a small puncture through the skin and fascia with a sharp-pointed knife, and inserts the needle. If one is in the pleural cavity the manometer will oscillate. Sometimes a drop of water or drop of fluid from the cavity gets into the needle and prevents oscillation. In this event have the patient clear the throat or make a slight cough, as this will often open the needle. If the needle is in the lung the manometer will not oscillate.

After one is sure he is in the pleural cavity, turn on the gas, 100 Cc. at a time, and take a reading. Do not run the pressure higher than plus one or plus two with new cases, and preferably with old cases, unless you are sure you have adhesions and are in a pocket. A high pressure will sometimes break adhesions loose, but this is a dangerous procedure and should be practiced with care. In the beginning, one should give 200 to 300 Cc. every two or three days until the lung is collapsed, then the injections can be postponed a few days each time. After patients have taken gas for two or three weeks, they can go from two to three weeks without a refill, but they should be examined in the meantime. If a lung once expands it usually sticks and will not come down. It is best to keep the patient on the table for several minutes after the injection to avoid any danger of embolism. In compressing for hemorrhage, one usually puts in enough gas at the first injection to stop the hemorrhage. This one can easily do, provided the lung is not bound to the chest wall with adhesions.

SYMPTOMLESS INFLUENZAL (STREPTOCOCCAL) MASTOIDITIS.

MUECKE and GRANTHAM-HILL in the *Lancet* of July 31, 1920, state their cases showed the following noteworthy features:

1. A very acute onset of earache occurring in the second or third day of a mild influenzal attack comprising pyrexia, malaise, coryza, and pains in the trunk and limbs.

2. The upper part of the drum was generally alone affected, displaying redness and bulging from the beginning.

3. Perforation occurred early, followed by unusual hemorrhage lasting for several days, accompanied by complete relief of all pain.

4. The posterior meatal wall became red and swollen shortly after the appearance of the discharge.

5. The discharge, at first slight, became on the second or third day profuse, coinciding probably with mastoid suppuration.

6. After perforation, other than discharge, there were no symptoms. That is to say, no pain, pyrexia, increase of pulse-rate, mastoid tenderness, or malaise.

7. On opening the mastoid, which was invariably of the pneumatic type, the chisel exposed softened, red, marrow-like bone, which showed early necrosis and absorption with the formation of large cavities full of pus. The extension was generally downward and backward.

8. The incomplete operation was performed in all cases, although in several the so-called "bridge" had already suffered necrosis.

9. The subsequent progress was unusually rapid and uneventful, and in no case was the hearing appreciably affected.

10. In all cases streptococci of the hemolytic influenzal type were found in large numbers.

The fact that they particularly wish to emphasize is that after perforation the patient was apparently proceeding satisfactorily, being free from all symptoms and often able to resume his ordinary pursuits until one or other of the dangerous sequelæ arose. Hence the importance of the early recognition of the only sign they have found to be constantly present—namely, the redness and swelling of the upper drum and posterior-superior meatal wall, together with the continuance, and especially the increase, of the discharge in a case of otitis media following influenza.

They have classified their cases into three categories: (*a*) Cases not recognized until the occurrence of dangerous sequelæ; (*b*) cases seen shortly after the appearance of the discharge; (*c*) cases followed from the onset.

This arrangement more or less represents their progressive knowledge of the disease, and they have little hesitation in believing that if the cases in class *c* had not been treated when they were they would have run the grave risk of following the same course as those in class *a*.

In class *b* it will be noticed that they attempted on several occasions to forestall the onset of mastoiditis by incision of the drum. Except in one case, which is not recorded, their efforts were unsuccessful.

THE ANTISCORBUTIC VITAMINE.

Hess, in the *New York State Journal of Medicine* for July, 1920, considers the various foodstuffs in regard to their vitamine content. It is well known to all that the chief sources of antiscorbutic vitamine are the fruits and the vegetables, and that they differ in potency in this respect. It may be added that they differ not only one from the other, but that they do not possess stable and constant antiscorbutic content. For example, it is erroneous to consider a vegetable such as carrots as possessing a definite amount of vitamine. Old carrots possess less of this factor than young carrots, and those which have been freshly gathered. This fact has to be considered in rationing antiscorbutic foodstuffs, either to individuals or to large bodies of men.

As previously mentioned, the antiscorbutic vitamine is peculiarly sensitive to drying, but under favorable conditions foodstuffs may retain this factor in spite of desiccation. Cabbage and tomatoes have been dried successfully in the laboratory by Givens and Cohen and by Givens and McClugage. But it should be thoroughly understood that commercially dehydrated vegetables, as prepared at present, are practically devoid of antiscorbutic value.

It is important that there should not be a sweeping denunciation of all dried foodstuffs. Milk can be dried and retain a very large part of its antiscorbutic vitamine, provided certain conditions are observed. In the first place, the milk must be rich in antiscorbutic vitamine before it is desiccated; second, it must be dried quickly, then it should be packed within the shortest possible interval; and, finally, the containers should be air-tight, preferably hermetically sealed. Recently he fed a scorbutic baby with milk which had been dried by the so-called Just-Hatmaker process—whereby it is subjected for a few seconds to about 230° F.—with the result that the hemorrhages of the gums began to be absorbed within three days and all symptoms to disappear shortly thereafter. This infant received dried milk to the equivalent of twenty-four ounces of fresh milk, and this preparation had been dried somewhat over three months before he made use of it. Not long ago Unger and the author, after curing a baby of scurvy by means of dried milk, maintained it in health for a subsequent period of three months on a diet which contained no additional source of antiscorbutic vitamine. He emphasizes this point partly because it illustrates the

peculiar relation of drying to the antiscorbutic vitamine, and because the workers at the Lister Institute, recently Barnes and Hume, have published reports to the effect that dried milk has lost its antiscorbutic property.

Foodstuffs in general lose their antiscorbutic quality in the course of canning. In this regard as in connection with dehydrating, the statements have been too sweeping. Under certain conditions the antiscorbutic factor may remain almost unimpaired. For example, tomatoes can be canned, in the course of which they are subjected to a twofold heating, and nevertheless remain one of the most potent antiscorbutic foods. This is due to their acid reaction, which protects them against both the heating and the subsequent aging. The fact that they are hermetically sealed also is an important factor. The effect of oxidation in diminishing the antiscorbutic factor is well illustrated when we store orange juice in the refrigerator in a vessel from which the air is not excluded. Within the course of a month its vitamine content is considerably diminished, and the deterioration proceeds as time elapses.

From a practical point of view it may be stated that canned tomato is the most serviceable antiscorbutic for artificially fed infants. It is well borne, comparatively inexpensive, and is available. As they have been shown by Osborne and Mendel to be rich in the water-soluble and the fat-soluble vitamines, canned tomatoes may be regarded, from a nutritional standpoint, as a palatable solution of the three vitamines. He has made use of this antiscorbutic for the past two years in feeding a large number of babies in the infant asylum with which he is connected, and can recommend it unreservedly in doses of one ounce a day. By substituting it for orange juice a great saving has resulted to the institution.

There is no foodstuff which from a practical point of view it is more important to understand than milk. Without going into detail, it may be stated that raising milk even to the low degree of heat of pasteurization destroys some of its antiscorbutic factor, and that if aging be added subsequent to this pasteurizing process, as is usually the case, the milk becomes still poorer in this quality.

As is well known, babies who are nursed rarely develop scurvy. This, however, should not be interpreted as indicating that human milk is particularly rich in antiscorbutic vitamine, but that the infant obtains a daily supply of this factor from birth. It is impossible to state with accuracy how much human milk a baby must receive to protect it fully from or to cure it of scurvy. In one instance eight ounces a day were found to be insufficient and twelve ounces barely enough to alleviate the signs and symptoms. Elsewhere he has shown that sixteen ounces of cow's milk suffices for the cure of infantile scurvy, so that it is evident that human milk and cow's milk do not differ largely in this particular. It may be added that the human milk in question was that of a woman on a liberal diet which contained an adequate amount of vegetables.

THE THERAPEUTIC APPLICATION OF BENZYL ALCOHOL, BENZYL BENZOATE, AND SOME HOMOLOGOUS COMPOUNDS.

In *Minnesota Medicine* for August, 1920, HIRSCHFELDER states that the alcoholic solutions of benzyl benzoate that were on the market, and in fact any mixture containing alcohol, has a very unpleasant, bitter, burning taste, but he has been able to disguise this entirely by using a new mixture, made up as follows: Pure benzyl benzoate 10 parts, emulsion of acacia 5, elixir eriodictyi aromaticum (National Formulary) 35—using doses of one teaspoonful of the mixture, which are somewhat larger than the doses advised by Macht. This is a pleasant mixture to take, and will be taken by persons who refuse the alcoholic solution, or any mixture containing it.

Hirschfelder has been able to secure relief of symptoms in a considerable number

of cases of conditions caused by spasm of smooth muscle—cardiospasm, pylorospasm, pain in gastric ulcer, and hyperacidity—and he has also seen relief from a spastic constipation. The relief occurs within half an hour after taking and lasts.

He has also been able to verify Macht's observation that benzyl benzoate brings about relief in many, but by no means all, cases of bronchial asthma, just as is true of atropine or other drugs that inhibit the vagus. Still more striking results have been obtained in the treatment of dysmenorrhea.

THE TREATMENT OF DIABETES.

BRIGHAM, in the *Boston Medical and Surgical Journal* of August 5, 1920, states that the treatment of diabetics to-day is more or less based on Allen's ideas, namely, starvation or fasting. It is the result of his work which makes it possible to have and keep these patients sugar-free. As time goes on various modifications have developed, for there are a great many people, in fact a large percentage, who do not need to undergo strenuous fasting with loss of weight and strength to accomplish their sugar-freedom. It is better to have the patients under observation for a longer period of time and maintain strength than to put them through a too severe initial fast. It is often hard to convince a patient that he is better after losing considerable weight and appreciable loss of strength.

When there is severe acidosis, rigid starvation often seems to do harm, but there are certain cases which respond beautifully to this method of treatment. Complete laboratory data at the start give the key as to how to treat each individual case. The most practical and satisfactory method of treating all classes of diabetics is along the lines described and taught by Joslin. To get good and consistently lasting results from treatment the first and most important requisite is a thorough study of the individual case; next the education of the patient in the knowledge of diets, food values, and urinalysis; and lastly a follow-up system which keeps the patient under observation and supervision without necessarily keeping the disease constantly before his mind.

Another very important part in the treatment of diabetics is not to be constantly increasing the diet. During the initial treatment their tolerance for carbohydrate, protein, and fat is found, and a total number of calories given which will keep the patient's blood figures normal. Some can take 30 calories per kilo, some 20, some less; others can take 40 or 50; but it is safe not to go over 30 calories per kilo unless the patient is a child, when a greater number of calories per kilo can be given with safety. Loss of weight is always a worry to patients, but if a case has a pancreas which can handle 20 calories per kilo at 90 pounds weight it is better to keep to this figure than to try and give more and eventually get into trouble. It is in these cases that the food substitute containing no value can be used, but too much of this type of food is in the end harmful, as patients should be encouraged not to be eating all the time.

The careful regulation of fluids and salt are essential, as a distressing edema often results when too much salt is used.

It is advisable when a patient leaves the hospital, after having been carefully studied and his tolerance obtained, to start him off on a lower diet, as the change from the hospital to the home often gives opportunity for mistakes, with resulting trouble. Part of the initial treatment is the recognition and removal of all possible foci of infection, for to a large extent the prognosis of the severe type of diabetes depends on the freedom from acute infections; an ulcerated tooth has often been the immediate cause of a precipitated coma. Surgical conditions, especially septic in type, are very common in diabetes, and it requires the greatest skill on the part of the surgeon, both in his method of anesthesia and in his surgical procedure, to bring the case through successfully; just as it requires care on the part of the medi-

cal man to prepare the patient for the operation and carry him along after the surgeon is through.

The treatment of impending coma and severe acidosis is a very difficult problem, and requires all the skill that the doctor, the nurse, and a well-equipped laboratory possess. Many a patient on the verge of coma, if brought through, proves to be of the mild type, and will live for many useful years.

QUININE AND ITS RELATED ALKALOIDS IN PHARMACOLOGY AND THERAPEUTICS.

DIXON, in the *British Medical Journal* of July 24, 1920, states that quinine administered by the mouth as one of its more soluble salts appears to be absorbed in the same way as other alkaloids. It passes for the most part through the stomach unchanged and is absorbed by the duodenum. No reason exists for supposing that it reaches the blood in any form other than quinine. The more soluble salts of quinine are absorbed a little quicker than the more insoluble, and the quinine esters—aristoquinine, euquinine, saloquinine, and the like—are absorbed considerably more slowly, since they require to be hydrolyzed by the alkali of the duodenum; no doubt, as in the case of analogous esters like salol, some are not hydrolyzed, and pass through the alimentary canal unabsorbed. All observers agree that individuals differ in the rate at which they absorb quinine, but it seems clear that when soluble salts are taken the whole of the quinine is absorbed, since none is found in the feces.

On reaching the blood quinine distributes itself in the various tissues, and Ramsden states that it accumulates in most tissues at a higher concentration than in the blood. Accumulation is especially marked in the suprarenal, spleen, and kidney. This is not the rule, as most alkaloids, as was shown first by Heger in 1873, and later by many other observers, tend to collect in the liver and are frequently excreted by the bile. Albertoni showed in 1876 that quinine could be detected in the bile of dogs two hours after oral administration. In the blood Baldoni found the greater percentage of quinine in the corpuscles, but Hartman and Zila and also Ramsden and Lipkin found more in the plasma; this is of importance in view of its action in malaria. Quinine is then excreted by the kidney unchanged.

All observers again agree that the excretion shows marked individual and daily changes. It may be detected in the urine half an hour after administration, but excretion may not be complete for two days. The whole of the quinine is certainly not excreted by the urine; we shall not be much out if we accept the figure of Nierenstein and state that about half the quinine ultimately finds its way into the urine unchanged; and most other observers give similar figures. As mere traces only are excreted elsewhere the quinine must either be stored up in the body or destroyed. The latter view is correct; estimation of the total quinine in the body will not account for that which is missing.

It has long been known that the liver destroys morphine, atropine, nicotine, and other alkaloids, and we have reasons for believing that this action is due to a ferment. An emulsion of rabbit's liver gives, after filtration through a Berkefeld filter, a liquid possessing a destructive power against alkaloids; this same emulsion, filtered through a Pasteur-Chamberland filter or heated for thirty minutes at 60° C., has lost this property. Ramsden has performed a similar type of incubation experiment with quinine, and finds that the liver, kidney, and intestinal wall have considerable power to destroy quinine post mortem, but that the suprarenal bodies, bone-marrow, etc., have not this property. It will be noticed here that the quinine tends to collect in high concentration in the spleen and suprarenal organs, and that it is just these organs which are unable to destroy it.

It was shown further in his laboratory that nicotine was destroyed the more readily by the liver if the animal had been

previously subjected to daily doses of the same alkaloid—that is, tolerance may be explained by enhanced ferment action. In the case of quinine this tolerance does not seem to be so clear, since some authorities state that as much quinine is excreted by those who habitually take the drug as by the novice. Nevertheless, Ramsden states that when quinine is administered in a succession of large doses an abnormally high proportion of that ingested is metabolized.

Lipkin showed that one product of the destruction of quinine by the liver is quitenine, which is identical with quinine except the vinyl group ($CH=CH_2$) is changed to the COOH group. This oxidation renders it relatively harmless, and were the oxidation carried no further would afford the animal some protection, but quitenine appears only as a trace in the urine, and oxidation of the quinine molecule must therefore proceed further.

Much has been written of the advantages and disadvantages of the various methods of administering quinine, but he believes that every one will agree with MacGilchrist that "subcutaneous and intramuscular injections (1 in 1 to 1 in 10) are inferior to quinine by the mouth in rapidity of action and thoroughness of absorption." In strong solution some of the quinine injected is fixed locally and not absorbed. When it is placed in muscle the surrounding fibers enter into rigor mortis, probably on account of the local liberation of lactic acid. Other drugs, like caffeine and potassium iodide, also produce rigor in muscle when injected in concentrated solution. This effect could be avoided by suitably diluting the quinine, in which case Nierenstein shows that no appreciable difference occurs in the excretion of the bihydrochloride whether given by the mouth or by injection into a vein or muscle. Nierenstein also gives the important fact that when more than 11 grains of quinine base per liter of urine are passed, a temporary albuminuria may ensue.

Doctors have been hampered in the past by having the sulphate of quinine thrust upon them; it is easy to prepare and therefore cheap. The two hydrochlorides seem to Dixon to be in every way superior.

Blackwater fever is yet another difficulty associated with quinine therapy. It is a subject on which Dixon feels he has no right to speak, except as to the validity of the evidence dealing with its causation. This evidence shows that the condition is not known in patients who take large doses of quinine for non-protozoal diseases. On the other hand, it does not appear to occur in malaria, at least in its typical form, unless large doses of quinine have been administered. The story of the attack is clear in its suddenness, and points to a sudden liberation into the blood of poison which destroys the corpuscles. Many such poisons are known, but quinine is not one of them. Sulphonal given daily in large doses accumulates in the tissues, and the patient may be free from its ill effects for weeks, but on the sulphonal attaining a certain concentration it suddenly acts and the patient may bleed half the blood in his body into the urine in the course of a few hours.

SURGICAL TREATMENT OF PROLAPSE OF THE UTERUS AND VAGINA.

Bell (*Lancet*, May 8, 1920) basing his contribution on 400 operative cases, resulting in 99 per cent of cures and a mortality of 0.5 per cent, first outlines the clinical types of prolapse. The following states, which may be encountered in varying degrees of severity, present themselves for consideration: (*a*) So-called "congenital" prolapse. (*b*) Puerperal retroversion and flexion, with slight actual, or with potential, descent. (*c*) Vaginal prolapse. (*d*) Prolapse of the uterus and vagina: during the reproductive period; after the reproductive period.

He exhibited one patient, repeatedly operated on, whom he cured at one sitting by the correct procedures. First, effective plastic work on the vagina was performed, together with amputation of the cervix. Next, the abdomen was opened and a

string-like band some six inches in length, representing the remains of the peritoneal fixation, was excised. The posterior segment of the peritoneal aspect of the pelvic floor was then reconstructed—an essential procedure—and the uterus was suspended by means of a modified Gilliam operation. The result has been perfect.

Puerperal retroflexion is in the first stage of a large majority of all cases of acquired prolapse of the uterus, and should be treated as such. In those cases in which the vagina is not stretched or torn a timely operation to cure the condition will save much operative work in the future. If there be vaginal laceration, this, of course, must receive attention; but when the retroflexion is the only important lesion—and it may be associated, when discovered, with slight descent—it is sufficient to perform a modified Gilliam operation alone. Bell has carried out this procedure 135 times in this class of case with excellent results and no mortality. It must be remembered, nevertheless, that in subsequent labors vaginal laceration may occur and necessitate further operative treatment; but, provided this is not too long delayed and a vaginal prolapse has not stretched the supravaginal cervix, the uterus will always, no matter how many may be the subsequent labors, maintain the good position that results from a properly performed modified Gilliam operation.

It is possible to have vaginal prolapse in association with a normally placed uterus. In most cases the vaginal prolapse is represented by a large cystocele, more rarely by a rectocele, and still more rarely by a cystocele and a rectocele. It must not be forgotten, however, that it is practically impossible for a vaginal prolapse to exist indefinitely without the supravaginal cervix being stretched, and prolapse of the uterus being produced, unless there be pelvic infection or some other pathological cause preventing the descent of the vaginal fornices.

If there be prolapse of the vagina alone, it is obvious that only plastic operations on the vagina will be required.

This state may exist in all degrees; there may be slight descent of both uterus and vagina; the vagina may be badly prolapsed and the uterus but slightly; the uterus may be much prolapsed and the vagina but a little; or the uterus and vagina may be completely prolapsed—procidentia. Now the treatment of these conditions—and we may include the so-called "congenital" prolapse to which reference has been made, for the treatment is much the same—would be easy and hardly worth discussing if vaginal plastic work was all that was necessary to effect a cure.

There are really only two classes into which we can divide cases of prolapse of the uterus and vagina in regard to surgical treatment: (*a*) prolapse during the reproductive period; (*b*) prolapse after or about the menopause.

In prolapse of the vagina and uterus before the menopause, and included in this category are the cases of so-called "congenital" prolapse, we must perform procedures compatible with subsequent parturition. Any operation that is incompatible must be ruled out of court.

Peritoneal ventrosuspension is a useless operation; either the adhesion disappears or a long, narrow, dangerous band is produced, which, of course, is of no use for supporting the uterus subsequently.

What then can we do with safety and efficiency for the cases in question? We must repair the vagina and perineum, amputate or repair the vaginal cervix if necessary, and suspend the uterus by a modified Gilliam operation. In bad prolapse—procidentia, and especially in so-called "congenital" prolapse—we must also repair, or rather reconstruct, the peritoneal aspect of the posterior segment of the floor of the pelvis.

In patients past the reproductive period after suitable preparation, if there is no descent of the uterus, vaginal repair alone may be carried out; but when there is any degree of descent, and especially in the presence of a cystocele—extremely common in this class of case—there is no operation to compare with the interposition operation,

together with properly performed colporrhaphies, anterior and posterior, and perineorrhaphy.

In a few exceptional cases it may be necessary to open the abdomen to reconstruct the posterior segment of the pelvis from above.

Operative treatment for prolapse is safe and effectual if satisfactory preparation and after-treatment be adopted in conjunction with proper operative technique.

No one procedure is suitable or satisfactory for every type of case.

THE FATALITY OF PEPTIC ULCER, AND THE IMPORTANCE OF EARLY DIAGNOSIS.

Carslaw and Cowan (*Glasgow Medical Journal*, May, 1920) note that simple peptic ulcer is generally recognized to be an "uncertain" and dangerous disease, but few of us perhaps realize that its mortality, as met with in hospital practice, is very considerable. In a series of 112 cases admitted into the Royal Infirmary under the care of one of the authors during the years 1906-16, fourteen patients died as the result of the ulceration, while another patient, who showed on post-mortem examination a latent ulcer in the duodenum, died from cardiac disease.

In contrast with the above series of cases the authors bring forward their experience of ulcer as met with in the Third Scottish General Hospital. There were treated many healthy young men who, often for rather trivial causes, were unable to remain with the colors. In civil life many of these patients would never have entered hospital, receiving treatment in their own homes or at a dispensary. Thus there was given the opportunity of observing in detail patients who, under ordinary circumstances, would have been under somewhat casual observation, and among them were a certain number of gastric cases with ulcer in the early stage.

A considerable number of cases of "peptic ulcer" came into the wards, but in this series were excluded those cases diagnosed elsewhere, which did not show any evidence of ulceration when under care; cases of gastric dilatation, without any signs of active ulceration; and several cases which had been operated upon for gastric symptoms prior to their admission. Leaving these patients out of account, there were admitted 30 patients, nearly one per cent of the total, who showed evidence of blood in the vomit or stools in association with gastric symptoms of varying severity. Of these 30 patients one died during his residence.

Four at least of the patients required operation, either from the persistence of hemorrhage or on account of its association with gastric stasis and dilatation. They all recovered from the operation, and three appeared likely to derive permanent benefit from it. In the fourth case a gastro-enterostomy could not be performed on account of wide-spread adhesions, and though his condition on dismissal had much improved, the ultimate outlook seemed dark.

Nine patients proved unsatisfactory. Their symptoms improved after admission up to a point, and operative treatment was not indicated, but they tended to relapse as soon as they returned to ordinary diet. They had ultimately to be invalided out of the service.

The most important feature of this series, however, is that no less than 15 of the patients, without any serious gastric symptoms, showed occult blood in their stools, some for even long periods of time—four, five, or in one case six weeks—but were all able to leave hospital "well." The majority of them were relieved from all their symptoms after a few weeks in hospital, and were with difficulty persuaded that the ulceration was not healed and still required a restricted dietary and rest in bed. It was only by strict discipline that their treatment could be maintained.

Take as an example the case of a man, aged twenty, admitted into hospital complaining of pain in the abdomen after food. It had not existed for long and was not severe, but sufficient to prevent him from

doing duty. Within three or four days all his discomforts disappeared, but the benzidin reaction was positive, and remained positive for thirty-seven days. It was negative on the forty-third day, for the first time. He had no recurrence of his symptoms and was discharged well. These patients were all young men, the majority between twenty and thirty years of age, and suffered from a type of ulceration that is not likely to be seen in our civil hospitals, or to receive serious consideration from their private doctors. Cases of this kind probably supply a number of those tragic incidents of sudden severe hemorrhage, or perforation, without warning, which all of us at times meet. It is with a plea for special care in the examination of patients suffering from "dyspepsia," and in particular for the examination of the stools for occult blood, that the authors bring this communication before the Royal Medico-Chirurgical Society.

HEMORRHAGE DURING OR AFTER THYRO-FISSURE IN THE REMOVAL OF THE VOCAL CORD FOR INTRINSIC CANCER OF THE LARYNX.

Moore (*Proceedings of the Royal Society of Medicine,* June, 1920) states that hemorrhage may occur either during removal of the growth, immediately following removal, or some hours after operation. During removal of the growth a considerable amount of bleeding may occur, but this can be controlled by gauze pressure. Persistent oozing frequently occurs after separation of the muscular attachment round the arytenoid; and a small vessel may be found between the arytenoid and lateral wall of the thyroid cartilage which occasionally spurts and may give considerable trouble in picking up with pressure forceps and ligaturing. However carefully any bleeding may be controlled before closure of the larynx, a reactionary or secondary hemorrhage may occur in from four to six hours. It is more likely to take place in full-blooded or alcoholic subjects, or in those cases in which the growth has extended deeply into the subglottic or posteriorly into the arytenoid regions, necessitating considerable excision of muscular tissue. Secondary hemorrhage may be due to a general oozing from the raw surface and be severe enough to necessitate reopening and gauze-packing of the larynx, or it may arise from the vessel in the arytenoid region and be due to slipping of a ligature applied before closure of the laryngeal fissure.

Eight cases of serious hemorrhage have been reported with four deaths. In most of these cases bleeding was observed during operation to occur from a spurting vessel in the arytenoid region.

The conclusion we may draw from his anatomical study is that in those cases in which it is necessary to cut through a considerable amount of muscular tissue close up to or including the arytenoid cartilage, the superior laryngeal artery may be cut or injured. Since the vessel in this situation lies close against the perichondrium, further separation of the perichondrium from off the thyroid ala is indicated so as to allow the vessel to be more easily seized by pressure forceps and securely ligatured.

THE ACTION OF MERCURY OXYCYANATE ON THE WASSERMANN REACTION.

Simons and Jones (*Urologic and Cutaneous Review,* June, 1920) conducted a study of the action of mercury oxycyanate (administered by deep injection) on the blood sera of 66 luetics who showed strongly positive Wassermann reactions. Nearly all of them were in the late tertiary or latent stage of the disease.

The study was begun in February, 1916, and finished May 31, 1917, some of the cases receiving treatment and observations during this entire period of 16 months. During both the treatment and the observation Wassermann tests were made of the blood sera practically every month.

The longest period that any case received treatment was 12 months; the shortest was

one month; the average duration of treatment in 66 cases was 5.9 months.

A good result was obtained in 21 cases (31.8 per cent); a fair result in 17 cases (25.7 per cent); for practical purposes one could combine these results and say that an adequate result was obtained in 38 cases (57.5 per cent).

In the 21 cases (in which good results were obtained) it required an average of 14.17 Cc. of a 1-per-cent solution of mercury injected during 2.6 months to produce a negative Wassermann reaction. Comparing this with the results obtained with the salvarsan preparations it would seem that this mercurial preparation is unusually potent. These cases were then treated for two additional months, receiving an average of 29.94 Cc. of mercury in order to render the Wassermann reaction thoroughly negative.

No result was obtained in 21 cases (31.8 per cent). This high percentage of failures may be accounted for by the possibility that some of the cases were Wassermann-fast or possibly because the routine treatment was not intensive enough.

Whatever may be said of other mercurial preparations, the oxycyanate certainly has some effect on the Wassermann reaction, so that even in the absence of salvarsan one can be assured of the fairly rapid action of mercury, if this salt is used.

Mercury oxycyanate has few untoward effects and can be given in this concentration intravenously as well as intramuscularly.

RAT REPRESSION.

A report by HOWARTH is summarized in the *Lancet* of June 26, 1920, as follows:

During the war, when not only the health of the armies but the food supplies of the nation became matters of vital importance, the danger of the rat both to the health and well-being of the community, military and civil, began to receive the attention it deserves. The Rats and Mice (Destruction) Act of 1919 put upon the citizens of London the responsibility of taking steps to destroy rats on their premises and of taking reasonable measures to keep the number of vermin in check. Dr. Howarth's report commences with an account of the natural history and habits of rats, and tells how to distinguish the brown from the black rat. Next are given some useful hints as to the best methods for making buildings proof not only against the ground-living and burrowing brown rat, but also against the agile and acrobatic black rat. The report warns the reader to protect all food supplies—including any waste foodstuffs thrown away—from rats, and might well lay more stress on this, possibly the most important of all measures for rat repression, since the birth-rate of rats is practically dependent on the available food supply. A sound motto to print on the top of any antirat propaganda would be: No Food, No Rats.

When the practical point is reached as to how actually to kill rats one becomes at once suspicious from the very number of different methods suggested. When in a pharmacopœia 50 different drugs are recommended to cure one disease, it is pretty certain that little confidence can be placed in any. Several types of trap are described, all no doubt good for a short while, but experience shows that no trap is of much use in any one place for more than a few nights, and a change of type of trap should be made frequently in each locality. Possibly the best method of trapping is by the use of lithographer's varnish spread on cardboard, on which the rats become as hopelessly involved as a fly on a flypaper. Of poisons barium carbonate and squill (scilla maritima) are the best and the safest. A very ingenious suggestion has been made by Rodier to the effect that by increasing the relative number of male rats the domestic felicity of these animals may be so upset that there will follow a marked diminution of the birth-rate. This theory is justified by observations made among domestic animals and birds; when the number of males in a flock or herd has been increased the birth-rate has invariably fallen, so that by destroying all female

rats caught and releasing all males a desirable result might be brought about. On the whole this report is a very interesting and useful synopsis of what is known of rat repression.

CONGENITAL EQUINOVARUS.

EIKENBARY (*Surgery, Gynecology and Obstetrics,* June, 1920) observes that there is no mystery surrounding the correction of a club-foot, nor are the surgical problems at all difficult. Some of the cases are quite resistant, some may relapse and have to be done over, some may require a cuneiform resection, but all of them may be given good walking feet. In spite of this, failures are quite common. Of the 114 cases embodied in this report, 60 had had previous operations or manipulations.

The writer considers that there are three reasons for failure:

The operator fails to grasp the fact that he is dealing with a triple deformity — equinus, varus, adduction of the anterior part of the foot.

The deformity is not overcorrected and frequently not even corrected.

The retentive apparatus is taken off too soon.

In considering treatment, it might be well to divide the cases into three headings, namely, mild or moderately severe cases in young babies; mild or moderately severe cases past six months of age; severe cases past the sixth year of life. Naturally the periods of time mentioned are merely suggestive. The extent of the deformity and the development of the individual should be the deciding factors.

In the first type, the correction can easily be brought about by the gradual method. The foot is manipulated at intervals of from a week to ten days, a plaster cast always being applied in the position of the greatest correction. The cast should extend above the flexed knee in order to prevent rotation, to relax the gastrocnemius, and also to prevent the child from kicking off the casts.

Full correction may be brought about by this method in a month; it may take several months, and it may fail entirely, depending upon the resistance of the tissues and the skill of the operator. When full correction is obtained, the foot should be retained in a plaster support, usually for a year. Toward the latter months of treatment it is the writer's custom to carry the cast merely to the calf line. In none of these procedures is an anesthetic necessary.

An anesthetic is necessary in moderately severe cases after the sixth month. The procedure is the same as that described above except that the correction is made at one sitting.

The foot is manipulated until it is flabby, and the varus and the adduction of the anterior part of the foot can be readily overcorrected. The Achilles tendon is then divided subcutaneously and the equinus corrected. The writer has never found it necessary to divide any of the structure along the inner side of the foot. Here again the cast is carried above the flexed knee, and for the same reasons as given above. A year or more is usually required to remove all tendency to revert to the original deformity.

By severe cases the writer refers to a certain type illustrated in his article. Here a cuneiform resection gives perfectly satisfactory results and does so quickly. A wedge of bone varying from a half-inch to an inch and a half or wider is taken from the mid-tarsal region, the base of the wedge being along the outer border, the thickness of the wedge depending entirely upon the amount of deformity, enough bone being taken out easily to admit of complete correction. The wedge extends through the entire width of the bony structure of the foot. Two or three kangaroo stitches are passed through the two bony sides and the raw areas of bone securely sutured. The Achilles tendon is usually divided, although not always. Owing to the extensive work done, the length of time required to effect a cure is much shorter than with the more conservative method. Six months is usually sufficient time to bring about a complete cure, and in many

instances the cure may be brought about in three or four months. The operation is only suitable in the severe cases.

As a final point in the cure of congenital equinovarus, the writer would like to emphasize the necessity of walking—that is, weight-bearing in the correct position—as a part of the cure. For this reason in the case of young babies, in whom the correction may have been made within a few months' time, the writer deems it necessary to keep these cases under his observation until they are walking. In cases in which stretching and tenotomy are done, as well as in the cases in which cuneiform resection is done, the writer insists upon walking in the casts at the earliest possible moment, thus materially helping in the adjustment of the structures of the foot to their new relations.

THE TREATMENT OF BIRTH FRACTURES.

BOORSTEIN (*American Journal of Diseases of Children,* May, 1920) notes that the method introduced during the war for the treatment of fractures of the femur has been most satisfactory in the case of birth fractures. The Thomas-Jones splint was employed. The directions for application are as follows:

A strip of adhesive plaster, to which a strong loop has been sewn at one end, is applied to each side of the leg or arm. The adhesive plasters should reach from as near the lesion as possible to the malleoli or to the wrist. The lower end of the strip should extend at least six inches below the sole of the foot or four inches beyond the tips of the fingers, and the sticky surfaces are covered with a piece of bandage so that they will not adhere. These ends are now tied to pieces of stout bandage, which in turn are passed the one over and the other under the wire rods of the splint, and returning to the center of the splint they are wound in the opposite direction once around the indentation or notch at the lower end of the splint and tied. A small piece of wood, in length about the width of the lower end of the splint, is now inserted an inch or two between the extension bands about two inches from the end of the splint, and the amount of traction is increased to any extent by twisting after the manner of a Spanish windlass or the old-fashioned link-saw rope. This is retained by catching the end of the wood under or over one of the rods of the splint as the twist requires.

Instead of adhesive plaster Boorstein used moleskin plaster, or Sinclair's glue, which does not irritate the skin. The moleskin plaster is so often used in orthopedic practice in treating tubercular joints in children, and is left on for months without causing irritation, that there is no reason why we should hesitate to apply it for a few weeks, even though the patient is an infant.

The peroneal ring is not as tightly applied as in adults, and it is covered with flannel or chamois. The brace extends about three or four inches beyond the foot. The flannel covering the ring can easily be slipped out and changed every two or three days, and the skin can be well powdered. To prevent drop-foot, a tongue depressor can be placed on the plantar surface of the foot and held by bandages to the bars of the splint. While wearing the brace the child can easily be carried around, which means a great deal to the happy mother who is anxious to show the child to the admiring relatives, or to the mother who is burdened with some other important home duties.

A roentgenogram can easily be taken and the results watched. It is also easy to administer massage through the flannel or muslin bandage. The child lifts up the foot together with the brace, and thus the proper voluntary movements are made and union is hastened.

For the upper extremity, the ring is applied to the same shoulder or to the opposite shoulder (the good one). The braces are left on for from three to five weeks. Only two precautions are necessary: (1) The foot or the hand has to be watched for swelling. That can be prevented if the

bands are loosened up once in a while and massaged. (2) The ring must not be too wide, as it will press on the axillary vessels, if the case is one involving the upper extremity, or on the other thigh if the case is one involving the lower extremity, and thus produce a deformity.

The children treated thus far have all done well, both the hospital cases and the ambulatory cases.

NON-SPECIFIC THERAPY.

CUNNINGHAM (*American Journal of Diseases of Children,* May, 1920) terminates a most interesting review of the literature of the past five years on anaphylaxis and related phenomena with the statement that there is a large and growing attention devoted to the treatment of various conditions by injecting foreign protein of a non-specific nature. The chief requisite seems to be that a sharp systemic reaction with fever and leucocytosis be produced. The initial rise in temperature may be followed by an abrupt decline to normal in pneumonia according to Cowie and Beaven. Good results have been obtained in a variety of diseases and by a large number of observers, and their reports, in many instances, are so complete that there is no doubt that such therapy has proved its usefulness when used with proper knowledge and care.

Miller and Lusk and Cowie and Calhoun report good results following the injection of such non-specific proteins as albumose or typhoid bacilli in the treatment of arthritis. As with other observers, patients with acute cases were more favorably influenced than were chronic ones. It is doubtful if cardiac complications were improved. Gonorrheal patients also were improved. The severity of the reaction to the injection was less in patients with infections of low virulence, and thus it seems that the reaction is not entirely a matter of the protein introduced. These authors suggest that bacteria in the affected joints were destroyed and added to the reaction by liberating other foreign protein. This explanation would convey the impression either that there are fewer bacteria in chronic cases, or that such bacteria are less susceptible to the injection.

Smith reports success in eleven cases of gonorrheal arthritis by injecting normal horse serum instead of antigonococcus serum. In his case the greater the reaction the better the result. In a later paper Miller makes a similar statement, and says further that an injection not allowed by a chill, although with marked leucocytosis, produces no beneficial results. The chief objection is the danger of grave or fatal reactions, and this form of therapy, according to this author, must be considered as being still in the experimental stage and may be placed in unwarranted disrepute by failure to observe proper precautions. Thomas, after treating eighty-six patients who had subacute and chronic rheumatism, concludes that the relief of pain is not permanent in more than 30 per cent, but that the remaining patients have done much better than those previously treated, and that such success and the small percentage of dangerous results must eventually force this method into more general use.

Cowie and Beaven state that, in pneumonia, the intravenous injection of protein is indicated only in the early stage, and is contraindicated in cases of influenzal pneumonia later than the third day. It is also contraindicated in cases showing undoubted evidence of advanced myocardial insufficiency or acute endocarditis. An intravenous injection of typhoid protein may bring about a termination of the acute symptoms in from one to three days. In the eleven cases of pneumonia quoted by these authors, it does not seem that more success was obtained than with the more recent specific intravenous treatment.

Auld, following the work of Novy and DeKruif, claims good results in treating asthma with subcutaneous injections of a solution of Witte's peptone. This is accomplished by desensitization. As the injection is non-specific there is no need of skin tests to determine the specific cause of

the asthma. The desensitization is only temporary. His results were better in cases of recent onset with attacks at fairly regular intervals. Small and increasing doses except in special instances are more effective than large doses.

Investigating the mechanism of this therapy, Jobling and Peterson find that leucocytosis is not essential. Hyperpyrexia seems to be a factor, but the fundamental change seems to be that injections bring about a reduction of the state of colloidal dispersion affecting not only serum protein but also serum lipoids.

Danysz believes that certain symptoms in disease are the result of anaphylaxis induced by microbes, living or dead, or by some foreign albumin, incompletely digested. The resulting anaphylactic sensitization has to be overcome, and the means for this do not need to be specific. He reports the treatment of 159 patients including 103 with various gastrointestinal disturbances, with an antigen made from emulsifying the bacteria in the patient's stool, or a similar hetero-emulsion. Better results were obtained from the autoantigen. In the majority of cases benefit was immediately manifested.

Nolf reports success with this form of treatment given intravenously in infectious diseases in Belgium. Specific vaccines he considers more accurate, but both methods are of value. Shock is to be avoided, but a mild reaction is advantageous.

Schamberg reports uniform success in treating and immunizing against poisoning by ivy. He accomplishes this by the oral administration of small and increasing doses of the tincture of the plant. He suggests this method in immunizing against other proteins such as the pollens.

Veroni considers that the liability to anaphylactic shock is much diminished by intraspinal injections of foreign serum instead of the usual intravenous or subcutaneous injections. The exceptions to this are cases in which there is inflammation of the meninges. Lewis suggests that the slow injection of foreign serum will prevent serum sickness in many cases.

COMPOUND FRACTURES, INCLUDING A STUDY OF 122 CASES TREATED BY BONE GRAFT.

Owen (*Military Surgeon*, July, 1920) observes that in many respects the "battle" fracture differs so much from the compound comminuted fracture as ordinarily seen as to deserve a distinctive name. Infection is practically always present and is severe and persistent. Comminution and fissure are most extensive; complications from injuries to nerves, muscles and blood-vessels are frequent; delayed or non-union is a common occurrence; refracture is not at all rare; and limitation of motion often persists in the neighboring joints even when they have not been involved in the fracture or infection. Certain complications, such as fibrosis of joints due to prolonged immobilization, arise due to the fact that these patients frequently are treated primarily with a view to their transportation rather than to the end result to be expected in the individual case.

The fractures now under observation in the army hospitals are of course those which were originally of the worst type, the simpler ones having been healed and the patients discharged or returned to duty; but it is with the fractures of this type or their sequelæ that the medical profession as a whole will have to deal for years to come, as these soldiers are discharged from the army hospitals and seek the advice of their home doctors.

The outstanding features of these cases are the persistence of the infection and the suppuration. From the data on hand the order of frequency in which the various bacteria occur is about as follows: Staphylococci, streptococci, gram-negative bacilli, gram-positive bacilli, diplococci.

Another interesting phenomenon is the development of an erysipeloid dermatitis at some distance from the wound. This is usually referred to as erysipelas, and it has been customary to isolate and handle these cases like erysipelas. The writer believes that this is a septic thrombosis of superficial vessels. Many such cases have been observed, and in practically all of them the

condition has arisen in the lower extremity and always distal to the wound. There is marked local and constitutional reaction. The local condition is the picture of erysipelas, but usually clears up within three or four days. The patient appears quite sick and the temperature may reach 105°, but no fatal case has been seen, and usually in about a week the patient is as well as ever. On theoretical grounds, as an autovaccination, the inflammation might be considered an advantage to the patient, but no marked improvement in the old wound seems to result. This inflammation or thrombosis sometimes follows an operation on the fractured bone and has also been observed in some cases following a brisk massage where the old wound was entirely healed.

After healing of the wound the infection may remain latent in the bone for many months, but is less likely to remain in the soft parts. We seldom see suppuration following secondary operations on the nerves, but after bone-grafting operations, performed long after healing has taken place, suppuration is frequent. In almost every case this suppuration is limited to the originally injured bone and does not involve the bone from which the graft was taken, which excludes the probability of infection at the time of operation.

The tetanus bacilli may also remain for months quiescent in the bone, though but one case of this disease has occurred among the hundreds operated upon. In this case the wound of the tibia was received in June, 1918. Four operations had been performed for osteomyelitis, at each of which it is supposed that antitetanic serum had been given. All wounds were healed by September 1, 1919. Operation (sliding graft of tibia) was performed March 7, and death occurred March 9.

Treatment of the infection is principally a matter of operative surgery—thorough excision of diseased tissue, removal of foreign bodies and sequestræ and eradication of bone tunnels so that the bone defects can be filled with the soft parts. To follow the operative treatment, nothing has been seen which can equal Dakin solution used with the Carrel technique. The great drawback to this method is that the technique is too elaborate. To give good results it must be used exactly as its originator directed, and few men can use it for any length of time without developing their own modifications and slighting the details. Even with this procedure carefully followed out, and with no *x*-ray or other evidence of sequestræ, foreign bodies, or necrosis, sinuses may persist. It is easy to say, "There is always an irritant at the bottom of a sinus," and many writers advise operation in these cases; however, with a sinus present, firm union may take place and function be restored, and it does not seem wise to jeopardize these by extensive exploration of the bone. A better rule in such cases would be not to operate without a known objective.

Where there is evidence of toxemia or systemic infection, repeated transfusion of blood is of great benefit. A transfusion is especially indicated as a preliminary to operation on a toxic patient.

Since the introduction of the newer methods of antiseptic treatment of war wounds and the bridging of bone defects by grafting, the swing of the surgical pendulum has been away from amputation; in the writer's opinion it has been performed too seldom. Amputation may have to be performed to remove an otherwise uncontrollable infection, and in order that it may be truly a "life-saving measure" it must be done before the infection has produced permanent changes in the internal organs. Occasionally it should be done to remove a hopelessly deformed limb, and in this case also the operation should be performed as early as possible. In the military service these patients as a rule are in the beginning of the most productive period of their lives, and a year or more spent in the treatment of an osteomyelitis is a big price to pay for a limb which will never function normally.

The cases in which amputation most often should be considered are those with fracture and osteomyelitis below the middle

third of the leg. If there is much loss of substance of the tibia, and especially if the spongy bone of the tarsus is involved, healing is apt to be very slow and to result in fibrosis of the ankle, shortening of the leg, and distortion of the weight-bearing line. In examining men for discharge, the writer is constantly impressed with the fact that men with this deformity are more handicapped than those with below-the-knee amputations.

There seems to be some relationship between the duration of the original infection and the percentage of cases which suppurated after operation. Taking the total number of cases, the percentage in which there has been some suppuration after the bone-grafting operation is very high, but the encouraging fact is that in a surprisingly great number of the suppurative cases the graft was successful. Considering only the cases in which a sufficient length of time has elapsed since the bone-grafting operation for the results to be evident, in 62 per cent of forty-six cases which suppurated after operation the graft was successful. In one case of non-union, following simple fracture, a graft had been introduced, there was no infection, the graft had been absorbed, and non-union persisted. A second bone graft was introduced, and at this operation the wound became infected and suppuration continued for five months, but during that time the graft lived and firm union took place.

As a working proposition one may say that it is reasonably safe to operate in the fourth month after healing; if the original infection persisted for two months or more, suppuration is to be expected in about 50 per cent of the cases; in over one-half of the suppurative cases the graft will be successful; good results may be expected in about 75 per cent of the total number of cases.

If suppuration does occur following a bone-grafting operation, intensive treatment with Dakin solution should be started at once. In this way the infection is usually quickly controlled and the soft parts close in over the bone. If an inlay graft has been used, held in place by catgut or kangaroo tendon, there is danger of the suture material being dissolved by the Dakin solution, and the bone must be perfectly immobilized to prevent displacement of the graft. For this reason a few pegs or screws of bone, in addition to kangaroo tendon to fasten in the graft, are an advantage.

In certain cases it seemed good practice to do the operation in two stages. Where there is a large adherent scar this should be excised and a pedicle graft of soft parts taken from the body or other limb. Later the operation on the bone can be performed through healthy skin. Where the *x*-ray shows foreign bodies, possible sequestræ or necrosis, a preliminary operation should be performed to remove these bodies and clear the ends of the bones. Particles of bone removed at this operation can be cultured, and should the wound be sterile the final operation can be performed as soon as healing takes place.

As refracture occurs quite frequently, a supporting apparatus must be worn much longer after union than is the rule with simple fractures. In fracture of the femur, a walking caliper with ischial weight-bearing should be worn for several months and until the *x*-ray shows a strong union. After fracture of the tibia with loss of bone substance a double bow-leg brace with partial weight-bearing at the tibial tuberosities should be used. In these cases there is frequently outward bowing of the tibia long after union has taken place, and to prevent this a leather cuff is attached to the inner bar of the brace and encircles the leg at the level of the fracture.

The regrettable sequel to battle fractures is the frequent, almost invariable, limitation of motion of neighboring joints due to fibrous changes. So far the fibrosis has shown little response to treatment, either surgical or mechanical, or to physiotherapy.

The great advance in treatment will come with a practicable method of fixing the fractured bone during the prolonged healing without including the neighboring joints in the immobilization.

OPERATIVE INJURY OF THE COMMON AND HEPATIC BILE-DUCT.

EISENDRATH (*Surgery, Gynecology and Obstetrics*, July, 1920) contributes a study upon this subject. He states that the object of his paper is to present these anomalies of the ducts and vessels as found in his own specimens and to show by a tabulation of a series of 51 case reports, including one of his own, that accidents during operation on the bile-ducts are not infrequently due to such anomalies. The surgeon who wishes to minimize the chances from such accidents must be familiar with the following observations:

The standard text-books of anatomy do not mention the variations which are of such importance to the surgeon. The cystic artery is described as a single vessel arising from the right hepatic shortly after the latter passes behind the main hepatic duct. Again, the mode of union of the cystic and hepatic ducts is stated as being always of the acute angular type. No mention at all is made of the plexus of veins and arterioles which lie on the surface of the common duct and cause an obstinate hemorrhage if overlooked.

The right hepatic artery varies greatly in its relation to the main hepatic and cystic ducts.

The variations in the course of the gastroduodenal artery and of one of its chief branches, the pancreaticoduodenal, must be borne in mind in operations on the common duct.

The cystic artery does not always arise from the right hepatic artery after the latter crosses the right edge of the main hepatic duct.

There is a single cystic artery in only 88 per cent of individuals instead of in 100 per cent as is generally taught. Even when single the cystic artery does not always arise from the right hepatic. An overlooked cystic artery arising from the gastroduodenal may cause severe bleeding when accidentally divided.

In 12 per cent of individuals there are two cystic arteries, both of which do not always arise from the right hepatic. In Eisendrath's case, after one cystic artery had been ligated during cholecystectomy, severe bleeding occurred from an overlooked second cystic artery. The hepatic duct was included in the grasp of the forceps while attempting to control the hemorrhage from the stump of a retracted second vessel.

In only 75 per cent of individuals do the cystic and hepatic ducts unite at an acute angle. When this does occur the terminal 2 centimeters are firmly held together by fibrous tissue. In 17 per cent the ducts pursue a parallel course before they unite; the latter may not take place until ½ to 1 centimeter above the ampulla. In 8 per cent the cystic duct makes a spiral twist around the front or back of the main hepatic duct before they unite to form the common duct.

Anomalies in the hepatic and common ducts may be found as variations in the mode of union of the right and left hepatic ducts before the main hepatic duct is formed, or as accessory hepatic ducts, or finally as a double common duct.

He divides the 51 cases of injury into four groups:

Those in which the injury was recognized at the time of the operation or shortly thereafter and immediate repair instituted. The majority of cases belong in this group.

Those in which an immediate or early repair of the injury was not successful, so that a secondary operation was necessary. There were four cases in this group.

The injury was overlooked at the time of the primary operation, so that only a secondary operation (usually for a stricture) was performed. There were 14 cases in this group.

In the last group are included miscellaneous cases. Analysis of the 51 cases reveals the fact that there are five modes of injury, as follows:

A resection of the junction of the cystic, hepatic, and common ducts. This often results from the angulation incident to traction during cholecystectomy, espe-

cially when a clamp is applied to the cystic duct.

Tear, ligation, or division of the main hepatic duct during cholecystectomy (19 cases). This injury may occur during separation of the pelvis (whether on the upper or lower side) of the gall-bladder from the common or hepatic ducts or when the cystic duct is very short or much dilated, or when the cystic and hepatic ducts are parallel, or the cystic duct winds around the main hepatic duct.

Common duct resected. This may occur in one of the ways described or the duct may be included in a clamp, resected or divided during cholecystectomy, or it may be torn during a choledochotomy.

In anomalies of the hepatic duct one case was reported by Kehr. The right hepatic duct emptied into the cystic duct, and was included in the clamp applied to the cystic duct.

Main hepatic or common ducts ligated or resected during effort to grasp the bleeding stump of a single cystic artery, or an overlooked single cystic artery having an anomalous origin or a second cystic artery, as in the writer's case. There were three cases which can be placed under the head of this mode of injury.

Any operator of large experience will agree with the writer that the pathological changes in many cases render it very difficult to avoid accidents. The operative field even under most favorable conditions is a limited one, and important structures lie in such close proximity that it is not surprising to read of the accidents just cited. One must remember that in all probability these 51 cases do not represent all of the accidents which have occurred. Many surgeons feel that such sequelæ are the result of faulty technique and do not publish their bad results. Although it is difficult to state with any degree of certainty as to how many of the reported accidents have been due to anomalies of the bile-ducts or blood-vessels, yet the author feels confident that a sufficiently large number are due to these variations from the normal to make it imperative that every surgeon be thoroughly familiar with them. Kehr believed that a relatively high percentage of his accidents (15 in his first 1000 cases) were due to such anomalies. The writer does not know how often these cases have been found in such a large series of operations on the bile passages as have been perofrmed at the Mayo Clinic, but no doubt some publication to elucidate this feature will appear in the near future from this and other clinics with a large material.

Eisendrath has found that the following precautions greatly minimize the chances of accidents during cholecystectomy or choledochotomy and warmly recommends them. They are the result of the development of a technique based partly on a relatively large operative experience and upon the study of a number of dissections of this region by the investigators quoted at the beginning of this article.

The incision should be so placed that an adequate exposure of the structures from the duodenum to the liver is obtained. The incision which was first suggested by Kehr adequately fulfils the above requirements. It extends from the ensiform to the umbilicus through the inner third of the right rectus muscle, thus exposing at once (especially if a table with an elevator for the gall-bladder region is used) the common duct and the structures adjacent thereto.

If cholecystectomy is decided upon, one can avoid the danger of encountering anomalies of the ducts and vessels in the majority of cases by an incision through the anterior leaf of the hepatoduodenal ligament and identification of the underlying supraduodenal portion of the common duct as our first landmark.

Care having been exercised not to injure any of the fine veins or arteries lying on the surface of the common duct, the next step is to separate the pelvis or ampulla of the gall-bladder (as first emphasized by W. J. Mayo) from the common duct.

The third step exposes the cystic duct and artery, main hepatic and common duct.

All of the steps of the operation thus far outlined are greatly facilitated by rotating the right lobe of the liver outward (Mayo-Robson grip), and making traction upon the fundus and later upon the ampulla of the gall-bladder. If the latter is tensely filled with calculi and liquid contents, the future steps are rendered far easier if the calculi and liquids are removed. The author's choice of technique is to begin at the neck as just outlined because the vital structures can be more easily identified before being covered with clots or infiltrated with blood, as so frequently occurs when removal is begun at the fundus.

The cystic duct should be ligated, preferably close to the common duct, with some material which will resist intrahepatic pressure longest. Fine kangaroo tendon is the most desirable for this purpose. In case there is parallelism or spirality of the cystic and main hepatic ducts, great care should be exercised in separating them before ligation of the cystic duct.

The cystic artery is easily isolated if it pursues its so-called normal course. It should be ligated as close to the neck of the gall-bladder as possible in order to prevent pulling the hepatic artery out too far. Anomalies of the various arteries can be easily avoided if one makes it a rule never to divide or clamp a strand of connective tissue in this region before one is certain that it does not contain some important duct or blood-vessel.

The cystic duct and artery should never be clamped until they have been isolated and ligated separately. The author prefers to use the finest artery forceps for the duct and vessel, and only apply them as an additional safeguard after the ligatures have been applied.

The removal of the gall-bladder from its bed in the liver by the subserous method requires no special mention except to call attention to the anomalies of the hepatic ducts previously described.

The supraduodenal portion of the common duct is the preferable location for choledochotomy. The duodenum should be retracted downward and search made for anomalous arteries crossing the common duct obliquely (anomalous origin of cystic artery) or transversely (pancreaticoduodenal or main gastroduodenal). The nearer one approaches the pancreas the more vascular does the field become; hence it is best to avoid the retroduodenal portion of the common duct if possible.

The chief arterial and venous blood supply of the liver and gall-bladder pursues its course upward between the folds of the hepatoduodenal ligament. Severe bleeding from overlooked or retracting vessels may be best controlled by grasping this ligament between the index-finger and thumb.

SOME PRINCIPLES INVOLVED IN THE TREATMENT OF EMPYEMA.

GRAHAM (*Surgery, Gynecology and Obstetrics,* July, 1920) concludes an article on this subject as follows:

The extensive recent literature on empyema reveals both a striking tendency toward a more or less standardized treatment, and a radical departure from methods in use prior to the war.

The cardinal principles of the avoidance of an open pneumothorax during the acute pneumonic stage of the disease, early sterilization and obliteration of the cavity, and the maintenance of the nutrition of the patient, are discussed in this article.

It is shown that the former prevalent conceptions of the mechanism of action of an open pneumothorax are incorrect.

In the normal thorax the mediastinal structures, instead of constituting a more or less rigid partition between the two pleural cavities, are in reality so mobile that to air pressure they offer a resistance which is equivalent to the pressure exerted by a column of water only 0.5 centimeter to 1 centimeter high (0.4 millimeter to 0.8 millimeter of mercury). This resistance is therefore negligible, and from the standpoint of pressure relationships the thorax can be considered as one cavity instead of

two. Any change of pressure, therefore, in one pleural cavity will manifest itself to practically the same degree in the other pleural cavity, with the result that both lungs will be about equally compressed. The situation in this respect is the same in the dog as in the human, and therefore experimental results obtained on the dog can be directly applied to the human.

The likelihood of a fatal asphyxia as a result of an open pneumothorax depends upon a number of factors, important ones of which are size of the opening and the vital capacity of the individual. A mathematical expression has been devised by which it is possible in a given case to approximate the maximum non-fatal opening in the chest wall if the vital capacity is known. One who has an average vital capacity (3702 cubic centimeters) and a normal thorax can withstand an opening in the thoracic wall of 51 square centimeters (8 square inches), but the individual of exceptional vital capacity (as, for example, 7100 cubic centimeters) can live with an opening of 101 square centimeters (16.6 square inches). A bilateral open pneumothorax is practically no more dangerous to life than a unilateral opening, provided that in each case the areas of the openings are the same. If the vital capacity is so low as to approximate the tidal air, even a very small opening may be fatal.

However, one attempting from this theoretical consideration to make large openings in both chest walls would revert to the commonly accepted belief that the mediastinum is a partition, and that double collapse is probably fatal.

As shown in the text, these observations have an important bearing on the question of open drainage of cases of empyema, particularly during the acute pneumonic stage when the vital capacity is low. After adhesions have formed and the mediastinum has become somewhat stabilized, both by adhesions and inflammatory induration, then the pressure relationships may be materially different on the two sides.

Effects of an open pneumothorax other than those directly upon the lungs are briefly considered, such as heat loss, changes in the systemic circulation, and danger of infection.

The value of Dakin's solution in sterilizing and obliterating empyemic cavities is shown, as well as its power to decorticate lungs.

Collapsing thoracoplastic operations have the disadvantage, even when successful, of apparently permanently reducing the vital capacity.

The maintenance of the nutrition of the patient is of fundamental importance.

SYPHILIS AND CHRONIC ABDOMINAL SYNDROME.

CASTEX and DEL VALLE (*Surgery, Gynecology and Obstetrics,* August, 1920) conclude an admirable clinical study as follows:

Hereditary syphilis is a very frequent cause—perhaps the most frequent—of membranous perienteritis and analogous conditions.

Its pathogenesis is complex as several factors operate, which set down in chronological order are: defects of conformation in the intestinal walls because of the faulty endocrine function which presides over and governs their development. These malformations on the one hand, and the abnormal function of the nervous system (sympathetic and autonomous), owing to the endocrine deficiencies, produce defects in the gastrointestinal statics and dynamics. As a consequence of the latter we have intestinal stasis which brings on chronic inflammation of the colon. From the wall of the colon the inflammation spreads to the surrounding serous membrane, aggravating the existing congenital lesions. The primary cause of all this is hereditary syphilitic infection, generally in the form of a late manifestation.

These cases, first of all, should be given mixed antisyphilitic treatment with mercury chiefly.

The surgical treatment is not to be

abandoned, but is to be restricted to cases in which definite indications confirmed by clinical and radiological diagnoses point to mechanical alterations of importance (kinks, adhesions, etc.); or to coexisting inflammatory lesions of adjacent organs: ovaries, tubes, appendix, gall-bladder, duodenum, and stomach. Surgical treatment should consist in separating membranes and in molding and mobilizing the peritoneum.

There is a group in which the patient suffers from the chronic abdomen, and yet there is no anatomical lesion of importance. These should be considered as types of "sympathicopathy," owing to the particular deficiencies, more or less marked, of the endocrine glands, as suprarenal capsules and thyroids principally. It is important to know this type of chronic abdomen, for it involves a prognosis and a therapeutic management very different from the membranous perienteritic type.

The prognosis depends on the anatomical and clinical type, and the period or stage of the affection; good, in cases of early diagnosis and rational treatment; less favorable, in those of late diagnosis where rational treatment is impotent in modifying chronic lesions already well developed. In these a more or less pronounced improvement is to be obtained by carrying out suitable surgical treatment.

RECENT ADVANCES IN THE DIAGNOSIS AND TREATMENT OF THYROID DISEASE BY THE USE OF ADRENALIN.

GOETSCH *(New York State Journal of Medicine,* September, 1920) records twelve cases in which the diagnosis of tuberculosis, either probable or suspicious, was made, and which have in practically every instance undergone a rigid antituberculosis therapy extending in some instances over years. The majority of these patients were referred to him from the Trudeau Sanatorium or from Saranac Lake. One recent case was referred from Loomis Sanatorium. It is not surprising, perhaps, that these patients should have been regarded as suffering from incipient tuberculosis by physicians in various parts of the country, particularly when one takes into consideration the clinical symptoms. Fortunately this group of patients had the advantage of a final expert pulmonary examination, which in most instances revealed very little or no tuberculosis at all. Tuberculosis was, therefore, not regarded as responsible for the clinical manifestations in these patients. This opinion was arrived at in the majority of these instances after a comparatively brief period at the sanatorium. In each instance, in view of all of the negative results obtained by hygienic and medical measures over considerable periods of time; the general incapacity of the patient; the relatively minor findings as regards pulmorary tuberculosis, and, finally, the positive reaction to the adrenalin test, it was clear that beyond a reasonable doubt these patients had been for some time and were at present suffering from a mild to moderate hyperthyroidism.

The Goetsch adrenalin test is one which demonstrates a constitutional hypersensitiveness to a subcutaneous dose of 0.5 Cc. of the 1-to-1000 solution of adrenalin chloride.

Hyperthyroidism, whether or not associated with tuberculosis, will give a positive reaction to adrenalin. Tuberculosis uncomplicated by hyperthyroidism does not react positively to adrenalin.

Goetsch states that there are some peculiarities about the glands of the body involved which suggest a special group of cases. The changes are neither in the nature of those found in Graves's disease nor those found associated with "fetal adenomata." The glandular pathology in these two types of thyroid disorder is well recognized and is known to be capable of producing hyperthyroidism. In this obscure group the following characteristics are fairly uniform. In the gross the thyroid gland is only moderately enlarged. It is

usually readily palpable and may be visibly enlarged. It has a fairly firm, slightly irregular glandular or lobulated feel. No definite nodules are palpable, and signs of increased vascularity are not demonstrable, such as thrills or bruits, in the gland or at the poles. At operation one frequently finds that the gland is loosely, sometimes quite firmly, adherent by its thickened capsule to the prethyroid muscles and to the large vessels and sternomastoid laterally, and one is reminded of a possible mild periglandular inflammatory reaction. This periglandular fibrosis sometimes makes it difficult to deliver readily the thyroid lobe. There is increased vascularity, particularly of a venous character, in the capsule of the gland. The thyroid arteries are only slightly if at all enlarged. The gland contains a moderate amount of colloid. It is of spongy consistence, friable, and has a marked tendency to ooze from the cut surface. There is not the familiar increased consistency of the gland as seen in exophthalmic goitre, nor is there the glistening character seen in colloid glands. Occasionally an increase in the fibrous tissues of the gland is noticeable. One is reminded of a condition possibly midway between that seen in exophthalmic goitre and that recognized in colloid goitre.

Microscopically there is found an increased amount of interstitial tissue, a large number of new-formed acini and so-called fetal tissue, together with aggregations of lymphoid cells scattered diffusely throughout the gland, not aggregated into discrete nodules, but forming true adenomata. Goetsch has named the condition "diffuse adenomatosis." Further studies indicate that this type of gland is abnormally active.

As the result of Goetsch's studies on the histological evidence of cellular activity in adenomata of the thyroid, he has been able to demonstrate intracellular structures called mitochondria, which have a great affinity for acid-fuchsin and are readily recognized in the cytoplasm of the cell as brilliantly red-stained granules, rods, and spiral filaments. The normal thyroid cell outside of the adenoma was found to contain very few of these bodies. He states that fetal adenomata of the thyroid are actively secreting structures and may be responsible for clinical hyperthyroidism. Further studies have shown that in all cases of exophthalmic goitre these structures are present in great abundance, while in colloid goitres they are few in number.

Regardless of the grosser histological structure of thyroid tissue, if one can demonstrate these mitochondria in excessive numbers in the thyroid cell, one can be sure that that cell is an active one. With this new cytological criterion of cellular activity we have a much more reliable means for the histological detection of activity of thyroid than we have had heretofore. With this method it has been possible to show the so-called "fetal cells" of the thyroid, whether occurring in diffusely scattered groups in the interstitial spaces or in aggregated nodules to form adenomata, are active, losing their activity only by the process of cellular degeneration, autolysis and destruction of the cells, and finally cyst formation in the case of the larger adenomata. Thus we see that clinical hyperthyroidism can be produced purely on the basis of hyperplasia of the interstitial tissue springing from the fetal cells of the thyroid, and is not necessarily due to primary activity of the parenchymal cells. This would be the case in nodular adenoma or in cases of so-called "diffuse adenomatosis" where the fetal or young cellular tissue is sprinkled diffusely throughout the gland. On the other hand, hyperthyroidism may be dependent upon a primary mild overactivity of the parenchymal cells with less evidence of fetal cell overgrowth, as in puberty hypertrophy. Now, in this group of so-called "diffuse adenomatosis" cases in which there is a latent hyperthyroidism hardly possible of diagnosis by ordinary means and in many ways simulating tuberculosis, there is a hyperplasia of the

interstitial fetal tissue with increased activity, and also an apparent mild overaction of the acinar cells of the thyroid. This overactivity is recognizable by the increase of mitochondria in the cells, particularly in the interstitial or fetal cell groups. These cells take on a rather striking reddish color, as compared with the remaining thyroid tissue.

The hyperthyroidism is these cases is more dependent upon hyperplasia and hyperactivity of fetal cell nests, and small, new-formed acini derived from these, than upon primary overaction of the true alveolar or parenchymal thyroid cells, as in puberty hypertrophy and exophthalmic goitre.

The importance of distinguishing between two such serious diseases as hyperthyroidism and tuberculosis need hardly be mentioned. The difficulty of recognizing the early stage of either disease in the first place, and secondly of distinguishing between the two, is very great.

There are doubtless many patients presenting themselves at sanatoria for tuberculosis with symptoms which appear not to be accounted for by the amount of tuberculosis, either active or inactive, which they have.

A positive adrenalin response helps to place the diagnosis on an impersonal basis, for on the basis of clinical symptoms and examination alone the syndromes of the two diseases in their early stages are so similar, particularly with reference to asthenia, loss of weight, irritability, mild tachycardia, labile pulse, and often a slight afternoon rise in temperature, that a differential diagnosis is well-nigh impossible, particularly if there is a very small amount of fibrotic change in the lung, perhaps at one apex, the nature of which it is impossible to determine.

An interesting differential point between the two diseases lies in this, that whereas tuberculosis responds rather promptly to a well-regulated hygienic life and to thorough rest, these cases of mild hyperthyroidism are but little benefited, even after prolonged periods of inactivity. In one case the patient had undergone rest cures at three different sanatoria during the course of five years, with very slight improvement indeed. Another had rested for five months without any recognizable benefit; another for several weeks, having previously sought relief from physician after physician during the course of about a year.

The peculiarity of the hyperthyroid cases is that, while they feel better at rest, they do not make progress in such a way as to allow them to again resume activity without bringing out almost immediately again the symptoms of which they complain. In other words, if such a borderline case fails to respond to the rest régime after a thorough trial and particularly when there is very little or no tuberculosis demonstrable, one should begin to think of hyperthyroidism as one of the possible causes of the patient's trouble.

THE FUNCTIONS OF THE CEREBROSPINAL FLUID.

DERCUM (*Archives of Neurology and Psychiatry*, 1920, vol. iii, p. 230) says that the cerebrospinal fluid is preëminently designed for the hydraulic suspension of the brain and cord; its function is hydrostatic. Its chemical constitution is essentially that of the innocuous three-quarters per cent common salt solution of the histologic laboratory. It has no action on the tissues with which it comes in contact: it is absolutely neutral and negative. It is distributed through the ventricles and subarachnoid spaces. It has no relation to the perivascular, pericapillary, or perineuronal spaces. It possesses no function of and plays no rôle in nutrition. The nutrition of the brain and cord takes place as does that of the other tissues—through its blood-vessels, the perivascular spaces playing the same rôle as do the perivascular spaces in the other organs and tissues. The

old belief that the brain and cord have no lymphatic system must be abandoned.

The cerebrospinal fluid has its source in the choroid plexuses and perhaps in the general serous surfaces of its containing cavities. It leaves the subarachnoid spaces of the cranium by passing through the arachnoidal villi into the venous current of the sinuses; also to a less extent by the lymph sheaths of the cranial nerves; from the spinal subarachnoid space it passes out by the lymph sheaths of the spinal nerves.

Attempts at modification of the brain and cord through the subarachnoid space, as in the Swift-Ellis method, are unscientific, as substances introduced into the cerebrospinal fluid rapidly disappear by passing out through the arachnoidal villi and the lymph spaces without in the slightest degree penetrating the nervous parenchyma; the beneficial effects hitherto ascribed to the Swift-Ellis and kindred methods are due entirely to the incidental spinal drainage. Medication of the nervous parenchyma must be attempted through the alimentary tract, through the skin, through the areolar tissue, or directly through the blood. A remedy should be sought the ions of which will readily osmose through the capillary walls. Spinal drainage is urgently indicated in tabes and paresis.—*American Journal of Syphilis,* July, 1920.

THE USE OF A RUBBER TUBE IN INTESTINAL SURGERY.

Balfour (*Surgery, Gynecology and Obstetrics,* August, 1920) notes that in such operations as rectosigmoid resections the use of the rubber tube has been an important factor in minimizing difficulties and risks, and it was in certain cases in this group that the tube was first employed as an aid in accomplishing a safe axial anastomosis. Its value, under these circumstances, had been recognized for several years; Rutherford Morison, Lockhart, Mummery, and other English surgeons were early advocates of its merits, and it had been employed in the Mayo clinic for some time previous to 1910, when Balfour described the technique of "tube-resections" of the sigmoid as then carried out in the clinic. Since that time certain modifications in the operative technique then described have been found advantageous; and, as is so frequently true, the higher efficiency which has come from such improvement in technical methods has made possible not only better results, but a definite increase in "operability." He has accepted as operable and successfully removed malignant tumors of the lower sigmoid or upper rectum, the operability of which, without the aid of the tube in the operation, would be at least highly questionable.

The tube in such cases is ¾ inch in diameter with ½ inch caliber, with a lateral eye about one inch from its upper end. After the resection is made the surgeon introduces the tube through the open end of the lower segment and passes it downward through the rectum and anus. There it is secured by an assistant and traction exerted upon it until the upper end of the tube is brought below the level of the cut end of the lower segment. The two ends of bowel are now approximated, properly aligned, and fixed by a stay suture in the middle of one lateral wall and a second stay suture at a corresponding point at the opposite side. At this latter point a heavy chromic catgut suture is begun. This suture is introduced from the mucous side and includes the mucous and muscular layers of the intestinal wall, and is continued posteriorly in this manner until the stay suture, which was first placed, is reached. His experience has been that if No. 2 chromic catgut is used and special care is taken to approximate the mucous membrane so that it does not extrude outside the bowel wall, a most satisfactory closure posteriorly can be secured. When the circular anastomosis is completed in the usual manner by a continuation of this chromic catgut suture, the tube is passed up the bowel by the assistant until it

reaches a point from 3 to 4 inches to one foot above the level of the anastomosis. The correct height of the tube must be gauged by the ease with which it takes its position in the upper segment. The tube, resting in its best position in the upper segment, is secured by a suture of heavy catgut placed close to the anastomosis line, so that the suture will be invaginated with the anastomosis later. The invagination, which he believes to be a very important feature of the operation, is then made by grasping the lower segment with fine-toothed forceps at a point about one inch below the line of anastomosis; and by means of these forceps the lower segment is supported while the assistant pulls downward on the tube until the anastomosis line is drawn into the lower segment, and the anastomosis is completely covered. The loose ring of the lower segment is then fixed to the upper segment by three or four interrupted sutures. The bowel, at the site of the anastomosis, then has the same appearance as that of a small intussusception. In some cases it is not possible to produce such an invagination because of the extent of the resection, and in some instances it is not even possible perfectly to unite the two ends of the bowel over the tube. It is surprising, however, to observe the excellent immediate and ultimate results in such unsatisfactory cases; and even in cases in which a visible defect in the line of the anastomosis was present (usually on the posterior side) a satisfactory convalescence has ensued. When a fecal fistula does occur, spontaneous closure can be anticipated. In the majority of cases it is quite safe to close the abdomen without drainage.

It is advisable under certain conditions to provide a safety-valve for the large intestine to prevent spasm of anal or recto-sigmoid sphincters at a time when distention of the colon should be guarded against. A rectal tube serves such a purpose excellently and may often be resorted to in place of a colostomy or appendicostomy.

Ineffective attempts to close colostomies are occasionally met with. Successful closing sometimes requires enough suturing of the opening in the bowel to constrict the lumen beyond what appears to be the limit of safety. The tube serves a useful purpose by preventing further contraction; and by conveying gases and fecal matter past the point of closure it gives the best possible condition under which healing may occur. In such cases the tube is introduced through the colostomy and passed out of the anus, leaving the upper end about 3 or 4 inches above the point of closure; it is removed in about ten days.

Balfour has repeatedly met with cases in which the extent of bowel resected has been so great or the segments so fixed, or both reasons, that approximation has been made difficult and an unsatisfactory union has resulted, on the mesenteric side particularly. When, however, such an anastomosis has been made over a good-sized rubber tube the results have been unmistakable evidence that the tube, immobilizing the two segments of bowel as it does, gives protection against leakage, because of the security against undue tension, with the possible results of a weakened or ruptured suture line. Fecal fistulas which occur under such circumstances have been insignificant, as a rule healing spontaneously in a short time.

A further and most important mechanical function of the tube is observed in its action as a splint. The danger of post-operative obstruction is always to be considered in those cases in which extensive scar due to previous operative interference or the adhesions of inflammatory exudates are present, for in the inevitable reformation of adhesions the bowel may be fixed in such a manner that immediate or later obstruction is possible. In such cases the tube within the bowel prevents any kinking or malposition which might occur in the reorganization of the exudative products which takes place in the first few days after operation.

REVIEWS.

CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY. Revised and edited by Arthur Robinson. Seventh Edition, Volume III, Head and Neck, illustrated. William Wood & Company, New York, 1920. Price $4.00.

It will be recalled that within the last few months we have noticed the appearance of Volumes I and II of this work. Instead of bringing the text out in one large volume it has been brought out in three small volumes of about 550 pages each. It will be recalled that Volume I dealt with the superior extremity and inferior extremity; Volume II with the anatomy of the thorax and abdomen; while Volume III deals with the anatomy of the head and neck. A number of the illustrations are excellently colored.

Cunningham's Anatomy has been for many years a standard book, and undoubtedly its appearance in this handy form whereby a clumsy volume is avoided, will add to its popularity both as a work of reference and when it is employed by the medical student whether studying at home or in the dissecting room.

MASSAGE AND EXERCISE COMBINED. Illustrated. By Albrecht Jensen, 220 West 42nd Street, New York City.

In a book of less than 100 pages, not including its full-page illustrations, the author of this little volume describes the methods which he uses, and which he believes ought to be used, in physical education. As he well says, "big muscles do not always indicate vitality or good health," and again, "the strength of the body is destroyed by violence and idleness, but preserved by exercise." In addition to deep breathing exercises, he describes a very large number of other movements, including self-administered massage, all of which exercises can be taken without the use of any apparatus whatever; or, in other words, if the reader will follow the movements, indicated in the excellent illustrations, in the morning when arising or at night when retiring, or, for that matter, at any other convenient time, he will keep his tissues in good shape and develop muscles which by inheritance or lack of exercise are poorly developed. The illustrations are designed both for men and women and are accompanied by clear directions given in a few words, so that any one with ordinary intelligence can practice them.

Unlike many books intended to relieve human ills, it can be placed with safety and advantage by the physician in the hands of a patient who will benefit by such moderate and wisely carried out exercises.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., assisted by L. F. Appleman M.D. Volume III, September, 1920. Lea & Febiger, Philadelphia, 1920.

As in previous years the September issue of Progressive Medicine contains a summary of diseases of the thorax and its viscera, including the lungs, heart, and blood-vessels, this article being prepared by Dr. O. H. P. Pepper. The article on dermatology and syphilis is by Dr. Jay F. Schamberg; that upon obstetrics by Dr Edward P. Davis; and that upon diseases of the nervous system by Dr. William G Spiller.

It will be recalled that the object of the authors in writing these articles is not merely to abstract the contributions made by others to medical literature, but to analyze and criticize such contributions so that the reader gets the advantage not only of the opinions expressed in the original paper, but of the collaborator as well, whose function it is to tell a story of the progress made in the department which he is considering.